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# NASA Tech Briefs

January-June 1967

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August 1967

#### SPECIAL NOTICE

Beginning with this issue of *Index to NASA Tech Briefs* a new category, Category 06 (Computer Programs), appears. Tech Briefs dealing with computer programs were previously announced in Category 01, Electrical (Electronic). Tech Briefs accessioned early in 1967 dealing with computer programs will be found in Category 01; the more recent acquisitions on this subject will be in Category 06. In addition to these announcement categories, the headings in the Subject Index provide the reader with a more specific approach regarding his area of interest. Therefore, the reader interested in computer programs is also advised to scan the appropriate headings in the Subject Index (e.g. computer, computer program, data processing, digital computer).

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# Introduction

This Index to NASA Tech Briefs lists the technological innovations published in this form during the period from January through June, 1967. The main section is arranged in six categories: Electrical (including Electronic); Physical Sciences (Energy Sources); Materials (including Chemistry); Life Sciences; Mechanical; and Computer Programs. A typical entry has these elements

```
TECH BRIEF NUMBER
                               TITLE
                                                           ABSTRACT
     B67-10021
     SPECIAL MOUNT IMPROVES REMOTE TRANSDUCER
     ACCURACY
                     /PRINCETON UNIV./
     LAYTON. J.
                                          JAN. 1967
         Transducer-mounting device allows measurement of
           transient pressure in a hostile environment. The
           device provides free passage areas and a
           controlled environment for the measuring
           instrument.
INNOVATOR
ORIGINATING SOURCE NUMBER
```

To help users locate information of value, three indexes are provided. The first is a subject index, arranged alphabetically:



Note that in this index several routes are opened for obtaining further information. If the title seems promising, the Tech Brief number and category may be used to locate the abstract, which will be found in the main section arranged sequentially by Tech Brief number

within each category. Further, the Tech Brief number can of course be used for obtaining a copy of the original Tech Brief.

The second index relates all items by the originating source and number to the Tech Brief number and category.

The third index relates all items by the Tech Brief number and category to the originating source and number.

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The purchase price of individual Tech Briefs, also available from the Clearinghouse, is  $15\phi$  each.

Other information on the availability of Tech Briefs may be obtained from:

# TECHNOLOGY UTILIZATION DIVISION NATIONAL AERONAUTICS AND SPACE ADMINISTRATION Washington, D.C. 20546

This *Index* supplements the *Cumulative Index to NASA Tech Briefs* (NASA SP-5021(04)) which was published in February 1967.

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#### 01 ELECTRICAL (ELECTRONIC)

B67-10001
PROGRAM COMPUTES SINGLE-POINT FAILURES IN
CRITICAL SYSTEM DESIGNS
BROWN, W. R. /N. AM. AVIATION/ JAN. 1967
MSC-603

Computer program analyzes the designs of critical systems that will either prove the design is free of single-point failures or detect each member of the population of single-point failures inherent in a system design. This program should find application in the checkout of redundant circuits and digital systems.

B67-10002
COMPUTER PROGRAM DETECTS TRANSIENT
MALFUNCTIONS IN SWITCHING CIRCUITS
CALVIN, E. L. /N. AM. AVIATION/ JAN. 1967
MSC-604

A program which accepts a system model in the form of Boolean equations and solves these equations using a ternary algebra will determine the response of large combinational and sequential switching circuits to given input changes, taking into account malfunctions due to races, hazards, and oscillations.

B67-10009
TESTER FOR STUDY OF ROLLING ELEMENT BEARINGS
ZARETSKY, E. V. FEB. 1967
LEWIS-305

Five-ball fatigue tester makes possible the study of rolling element phenomena. The device consists of a driven test ball pyramided upon four lower balls positioned by a separator and free to rotate in an angular contact raceway.

B67-10013 SELF-STARTING PROCEDURE SIMPLIFIES NUMERICAL INTEGRATION JAN. 1967 SEE ALSO NASA-TN-D-2936 ARC-50

A self-starting, multistep procedure for the numerical integration of ordinary differential equations is devised to produce all the required backward differences directly from the initial equations. The self-starting element eliminates nonessential tallying to determine starting values.

B67-10015
ALUMINIZED THIN-WINDOW PROPORTIONAL-COUNTER
TUBE IS STRONGER, MORE RESPONSIVE IN LONG
WAVELENGTH REGION
SCHNOPPER, H. W. SHIELDS, R. A. /CORNELL UNIV./
JAN. 1967
JPL-689

A thin-window proportional counter tube of 0.25-mil Mylar with a thin aluminum coating on one side permits efficient detection of long wavelength X-rays. It is sufficiently rugged for long-term use in space or other demanding environments.

B67-10017 SHORTENED HORN-REFLECTOR ANTENNA LANTZ, P. A. JAN. 1967 GSFC-502

A shortened horn-reflector antenna overcomes the mechanical disadvantages and complexity of the conventional horn-reflector antenna. The shortened antenna offers broadband performance, economic construction, very low antenna temperature, and excellent pattern performance.

B67-10020 MINIATURE CAPACITOR FUNCTIONS AS PRESSURE SENSOR HARRISON, R. G. FEB. 1967 JPL-903

Miniature capacitor operates as a differentialpressure telemetry sensor during free flight of test model in a hypersonic wind tunnel. The capacitor incorporates a beryllium copper diaphragm. It is also used as an absolute pressure sensor.

B67-10022
VARIABLE-PULSE SWITCHING CIRCUIT ACCURATELY
CONTROLS SOLENGID-VALVE ACTUATIONS
GILLETT, J. D. /N. AM. AVIATION/ FEB. 1967
H-FS-1895

Solid state circuit generating adjustable square wave pulses of sufficient power operates a 28 volt dc solenoid valve at precise time intervals. This circuit is used for precise time control of fluid flow in combustion experiments.

B67-10025
COMPUTER/PERT TECHNIQUE MONITORS ACTUAL
VERSUS ALLOCATED COSTS
HOURY, E. WALKER, J. D. FEB. 1967
LEWIS-260

A computer method measures the user\*s performance in cost-type contracts utilizing the existing NASA program evaluation review technique without imposing any additional reporting requirements. Progress is measured by comparing actual costs with a value of work performed in a specific period.

B67-10027
FEED-THROUGH CONNECTOR COUPLES RF POWER INTO VACUUM CHAMBER
GRANDY, G. L. /WESTINGHOUSE ASTRONUCL. LAB./FEB. 1967
NU-0096

-0096
Feed-through device connects RF power to an RF
coil in a vacuum chamber. The coil and leads are
water cooled and vacuum tight seals are provided
at the junctions. The device incorporates silver
soldered copper tubes, polytetrafluoroethylene
electrical insulators, and O-ring vacuum seals.

B67-10028
MONITOR ASSURES AVAILABILITY AND QUALITY OF COMMUNICATION CHANNELS
SMITH, G. P. /RCA/ FEB. 1967
KSC-66-38

System monitors a communication channel for proper circuit parameters and energizes an alarm if these parameters do not fall within allowable limits. It comprises a monitor-signal transmitter at the transmitting end of the channel and a monitor-signal receiver at the receiving end.

B67-10029
INSTRUMENT SEQUENTIALLY SAMPLES AC SIGNALS
FROM SEVERAL ACCELEROMETERS
CHAPMAN, C. P. FEB. 1967 SEE ALSO B66-10462
JPL-884

Scanner circuit sequentially samples the ac signals from accelerometers used in conducting noise vibration tests, and provides a timeaveraged output signal. The scanner is used in conjunction with other devices for random noise vibration tests.

B67-10030 LOCAL MEASUREMENTS IN TURBULENT FLOWS THROUGH CROSS CORRELATION OF OPTICAL SIGNALS FISHER, M. J. FEB. 1967 M-FS-1268

Crossed beam correlation method measures turbulent fluctuations in transonic and supersonic flows. Two collimated beams of radiation are crossed at the point of interest in the flow, and the power loss of each beam is measured with two independent photodetectors, which yield information about the turbulent properties.

B67-10031 HIGH TRANSIENTS SUPPRESSED IN ELECTROMAGNETIC DEVICES MARION, C. W. FEB. 1967 KSC-66-13

A bifilar winding around the magnetic core of electromagnetic devices suppresses high transient voltages. The winding is alternately spaced vertically and radially from the core to achieve a high coefficient of coupling.

B67-10035
THEMOELECTRIC METAL COMPARATOR DETERMINES
COMPOSITION OF ALLOYS AND METALS
STONE, C. C. WALKER, D. E. FEB. 1967
ARG-235

EMF comparing device nondestructively inspects metals and alloys for conformance to a chemical specification. It uses the Seebeck effect to measure the difference in EMF produced by the junction of a hot probe and the junction of a cold contact on the surface of an unknown metal.

B67-10038
RESIDUAL MAGNETISM HOLDS SOLENOID ARMATURE
IN DESIRED POSITION
CRAWFORD, R. P. /GEN. DYN./ MAR. 1967
LEWIS-343

Holding solenoid uses residual magnetism to hold its armature in a desired position after excitation current is removed from the coil. Although no electrical power or mechanical devices are used, the solenoid has a low tolerance to armature displacement from the equilibrium position.

B67-10040 STUDY MADE OF EXPLOSIVE CUTTING IN SIMULATED SPACE ENVIRONMENTS COLEMAN, E. R. HAMILTON, L. O. /HAYES INTERN. CORP./ MAR. 1967 SEE ALSO NASA-TM-X-53440 M-FS-1597

Study indicates the feasibility of explosive cutting and establishes techniques applicable to in-space cutting operations. Results show no degradation of the explosive and that work hardening of the target material is limited to the cut edge.

B67-10041
ABSOLUTE VISCOSITY MEASURED USING INSTRUMENTED PARALLEL PLATE SYSTEM BROYLES, H. H. MAR. 1967
JPL-874

An automatic system measures the true average shear viscosity of liquids and viscoelastic materials, using the parallel plate method and automatically displays the results on a graphic record. This eliminates apparatus setup and extensive calculations.

B67-10042 IMPROVED FLUID CONTROL CIRCUIT OPERATES ON LOW POWER INPUT GEBBEN, V. MAR. 1967 LEHIS-325

Standard electromagnetic relay actuates fluid control circuits with low level electrical signals by switching a fluid amplifier that drives a spool value.

B67-10046
MULTIPURPOSE INSTRUMENTATION CABLE PROVIDES
INTEGRAL THERMOCOUPLE CIRCUIT
ZELLNER, G. /WESTINGHOUSE ASTRONUCL. LAB./ MAR.
1967
NU-0108

Hultipurpose cable with an integral thermocouple circuit measures strain, vibration, pressure, throughout a wide temperature range. This cable reduces bulky and complex circuitry by eliminating separate thermocouples for each transducer.

B67-10053
SOLID-STATE TIME-TO-PULSE-HEIGHT CONVERTER
DEVELOPED
LYNCH, R. J. RODDICK, R. G. MAR. 1967
ARG-170

Solid-state circuit produces an output pulse with an amplitude directly proportional to the time interval between two input pulses. It uses selected circuit options to achieve variable mode operation and a tunnel diode controls the charging time of a capacitor in proportion to the time interval being measured.

B67-10055 CIRCUIT MULTIPLIES PULSE WIDTH MODULATION, EXHIBITS LINEAR TRANSFER FUNCTION CARLSON, A. W. FURCINITI, A. MAR. 1967 HQ-56

Modulation multiplier provides a simple means of multiplying the width modulation of a pulse train by a constant factor. It operates directly on a pulse width modulated input signal to generate an output pulse train having a greater degree of width modulation than the input signal.

B67-10060
ELECTRON MULTIPLIER HAS IMPROVED
PERFORMANCE AND STABILITY
INNOVATOR NOT GIVEN /G.C.A. CORP./ MAR. 1967
GSFC-546

Electron multiplier contains a series of massive metal dynodes, compactly secured with ceramic rods for operation in a metal housing. The housing is rigidly mounted within a soft steel vacuum enclosure which shields the multiplier from the effects of external electromagnetic fields.

B67-10061
CONTROL CIRCUIT ENSURES SOLAR CELL
OPERATION AT MAXIMUM POWER
PAULKOVICH, J. MAR. 1967
GSFC-432

closed fluid systems.

Control circuit enables a solar cell power supply to deliver maximum electrical power to a load. It senses the magnitude of the slope of the voltage-current characteristic curve and compares it to a reference voltage which represents the slope corresponding to the desired operating limits.

B67-10065
PORTABLE DETECTOR SET DISCLOSES HELIUM
LEAK RATES
ANDERSON, G. E. /N. AM. AVIATION/ APR. 1967
M-FS-1733
Portable helium detector measuring helium leak
rates makes possible the use of the inert gas
helium as a tracer. This helps solve safety and

B67-10074
FLOW-TEST DEVICE FITS INTO RESTRICTED
ACCESS PASSAGES
FITZGERALD, J. J. OBERSCHMIDT, M. ROSENBAUM, B.
J. APR. 1967

contamination problems in detecting leaks in

MSC-1078

Test device using a mandrel with a collapsible linkage assembly enables a fluid flow sensor to be properly positioned in a restricted passage by external manipulation. This device is applicable to the combustion chamber of a rocket motor.

B67-10076
CLEANROOM AIR SAMPLER COUNTS, CATEGORIZES,
AND RECORDS PARTICLE DATA
NELSON, M. B. /IIT RES. INST./ JUN. 1967
M-FS-2221

Light scattering particle counter monitors particles in a clean room. It categorizes and records the particles according to size and functions simultaneously in three separate areas. The counter uses a transducer head to transform light signals into electric signals.

B67-10077
COMPUTER PROGRAM SIMULATES DESIGN, TEST,
AND ANALYSIS PHASES OF SENSITIVITY
EXPERIMENTS
ALEXANDER, M. J. ROTHMAN, D. ZIMMERMAN, J. M.
/N. AM. AVIATION/ APR. 1967
H-FS-1496

Hodular program with a small main program and several specialized subroutines provides a general purpose computer program to simulate the design, test and analysis phases of sensitivity experiments. This program allows a wide range of design-response function combinations and the addition, deletion, or modification of subroutines.

B67-10080
INSTRUMENT CONTINUOUSLY MEASURES DENSITY
OF FLOWING FLUIDS
JACOBS, R. B. MACINKO, J. MILLER, C. E. /NBS/
APR. 1967

LEWIS-309

Electromechanical densitometer continuously measures the densities of either single- or two-phase flowing cryogenic fluids. Heasurement is made on actual flow. The instrument operates on the principle that the mass of any vibrating system is a primary factor in determining the dynamic characteristics of the system.

CIRCUIT INCREASES CAPABILITY OF HYSTERESIS SYNCHRONOUS MOTOR

MARKOWITZ, I. N. /RCA/ APR. 1967

MSC-1080

Frequency and phase detector circuit enables a hysteresis synchronous motor to drive a load of given torgue value at a precise speed determined by a stable reference. This technique permits driving larger torgue loads with smaller motors and lower power drain.

B67-10085

TRIPLE MODULAR REDUNDANCY /THR/ COMPUTER OPERATION IMPROVED

BALL, M. HARDIE, F. H. /IBM/ APR. 1967 MSC-831

Switching off a failed element plus one of the good elements in the TMR computer operation keeps the reliability curve from crossing the simplex curve. This method increases reliability and prevents system failure.

AUTOMATIC CHANNEL SWITCHING DEVICE

BALL, M. OLNOWICH, H. T. /IBM/ APR. 1967 MSC-832 MSC-834

Automatic channel switching device operates with all three triple modular redundant channels when there are no errors. When a failure occurs, channel and module switching isolate the failure to a specific channel. Since only one must operate correctly, reliability is increased.

B67-10087

TRANSLATOR PROGRAM CONVERTS COMPUTER PRINTOUT INTO BRAILLE LANGUAGE

POWELL, R. A. /BOEING CO./ APR. 1967 M-FS-2061

Computer program converts print image tape files into six dot Braille cells, enabling a blind computer programmer to monitor and evaluate data generated by his own programs. The Braille output is printed 8 lines per inch.

SYSTEM AUTOMATICALLY SUPPLIES PRECISE ANALYTICAL SAMPLES OF HIGH-PRESSURE GASES LANGDON, W. M. /IIT RES. INST./ APR. 1967 M-FS-1814

High-pressure-reducing and flow-stabilization system delivers analytical gas samples from a gas supply. The system employes parallel capillary restrictors for pressure reduction and downstream throttling valves for flow control. It is used in conjunction with a sampling valve and minimizes alterations of the sampled gas.

B67-10091

SYSTEM MAINTAINS CONSTANT PENETRATION DURING FUSION WELDING

COOK, G. /MERRIK ENG./ MC CAMPBELL, W. M. APR. 1967

M-FS-937

Servo system senses variations in fusion welding process, and adjusts the control parameters to compensate for them. The system assumes a correlation between uniform weld penetration and temperature gradients near the molten puddle. It senses weld properties and makes adjustments to travel speed and weld current.

GREMEX-A NEW MANAGEMENT TRAINING CONCEPT DENAULT, M. F. VACCARO, M. J. APR. 1967

GSFC-574

Goddard Research Engineering Management Exercise provides experience in R+D project decision making from a management rather than technological view. The participant directs a

hypothetical project presented in the management simulation technique. He uses old or new methods without concern for rewards or penalties existing in real life.

B67-10093

STRAIN GAGE CIRCUITRY PROVIDES FATIGUE TESTING MACHINE WITH ACCURATE CYCLE COUNT PARK, R. /WESTINGHOUSE ASTRONUCL. LAB./ APR. 1967

NU-0114

Fatigue tester determines the number of cycles to fatigue failure of brittle specimens. A strain gage on the loading arm records the loading applied to the component. As the component starts to break, the load is reduced and the strain gage stops the cycle counter.

B67-10097

HEATER CONTROL CIRCUIT PROVIDES BOTH FAST AND PROPORTIONAL CONTROL

BASLOCK, R. W. /IBM/ APR. 1967

M-FS-906

Proportional control circuit supplies a heater with full current, from a pulsating dc source, to a present temperature and then switches to proportional control for fine temperature regulation. Two resisters and a diode are added to the existing circuit. The circuit can be adapted to control other functions.

B67-10099

SYSTEM ENABLES MORE COMPLETE CALIBRATIONS OF DYNAMIC-PRESSURE TRANSDUCERS
PERNET, D. F. /IIT RES. INST./ APR. 1967

M-FS-2063

Absolute pressure calibration system using a Michelson interferometer calibrates phase characteristics and pressure sensitivities of the transducers that monitor acoustic or aerodynamic pressure fields. The interferometer uses a helium-neon laser light source and interchangeable acoustic signal generators to produce acoustic

B67-10101

DOUBLE EMITTER SUPPRESSED CARRIER MODULATOR USES COMMERCIALLY AVAILABLE COMPONENTS
HAIST, C. F. PISCOPO, A. /IBM/ APR. 1967
H-FS-2494

Double emitter suppressed carrier modulator develops a signal-to-carrier minimum output ratio of 40 db and signal input of 2.5 volts. The circuit uses a commercially available double emitter chopper transistor. It eliminates tuning potentiometers and reduces sideband harmonics.

B67-10103

POLYNOMIAL MANIPULATOR AP-168 TUTT, G. E. /N. AM. AVIATION/ MAY 1967 MSC-1231

Linear Systems Design Evaluation Program, AP-168 combines the many different analysis techniques used to evaluate and manipulate polynomials. The single program is a pseudo instruction abstraction. It allows the user to enter polynomials of the Laplace operators and to manipulate them freely.

B67-10104

PARAMETRIC UP-CONVERTER INCREASES FLEXIBILITY OF MASER SUMMY, R. H. APR. 1967 KSC-67-98

Parametric up-converter translates a broad band of signals to the fixed tuned input frequency of a maser. This modified maser can operate in the 1700-2300 Mc range, eliminating the need to duplicate equipment. It may be applied in communications and radio astronomy.

RF INDUCTOR HAS HIGH Q, IS STABLE AT HIGHER TEMPERATURES WILER, E. M. MAY 1967 JPL-1019

Encapsulated RF inductor with an insulated coil has a high Q and remains stable for long periods of time at high temperatures. The coil is wound on a core and both are encapsulated in an epoxy resin. Two terminals are soldered to the coil.

B67-10108
COMPUTER PROGRAM REDUCES CALCULATION TIME
OF NORMAL RESPONSE FUNCTIONS
ALEXANDER, M. J. ROTHMAN, D. ZIMMERMAN, J. M.
/N. AM. AUIATION/ MAY 1967
M-FS-1517

Fortran II computer program rapidly calculates parameters of maximum likelihood estimates from sensitivity experiment data populations. The program uses the Newton-Raphson iterative procedure to calculate the mean and standard deviation of portions of the cumulative normal response function.

B67-10111
FIXTURE TESTS BELLOWS RELIABILITY THROUGH
REPETITIVE PRESSURE/TEMPERATURE CYCLING
LEVINSON, C. /SPERRY GYROSCOPE CO./ MAY 1967
MSC-1176

Fixture explores the reliability of bellows used in precision in inertial systems. The fixture establishes the ability of the bellows to withstand repetitive over-stress pressure cycling at elevated temperatures. It is applicable in quality control and reliability programs.

B67-10115
LIQUID HYDROGEN DENSITOMETER UTILIZES
OPEN-ENDED MICROWAVE CAVITY
SMETANA, J. WENGER, N. C. APR. 1967 SEE ALSO
NASA-TN-D-3680
LEWIS-390

Open-ended microwave cavity directly measures the density of flowing liquid, gaseous, or two-phase hydrogen. Its operation is based on derived relations between the cavity resonant frequency and the dielectric constant and density of hydrogen.

B67-10116
DETECTION OF ENTRAPPED MOISTURE IN HONEYCOMB SANDWICH STRUCTURES
HALLMARK, W. B. /N. AM. AVIATION/ MAY 1967
MSC-1103

Thermal neutron moisture detection system detects entrapped moisture in intercellular areas of bonded honeycomb sandwich structures. A radium/beryllium fast neutron source bombards a specimen. The emitted thermal neutrons from the target nucleus are detected and counted by a boron trifluoride thermal neutron detector.

B67-10118
TV SYNCHRONIZATION SYSTEM FEATURES
STABILITY AND NOISE IMMUNITY
LANDAUER, F. P. MAY 1967
JPL-915

Horizontal jitter in the video presentation in television systems is prevented by using an additional sync level. This circuitry uses simultaneous signals at both sync and porch frequencies, providing a sync identification from which a coincidence circuit can generate pulses having the required stability and noise immunity.

B67-10119
PERSONAL COMMUNICATION SYSTEM COMBINES HIGH
PERFORMANCE WITH MINIATURIZATION
ATLAS, N. D. /N. AM. AVIATION/ MAY 1967
MSC-720 MSC-722

5-720 msc-722
Personal communication system provides
miniaturized components that incorporate high
level signal characteristics plus noise rejection
in both microphone and earphone circuitry. The
microphone is designed to overcome such spacecraft
flight problems as size, ambient noise level, and
RF interference.

B67-10125
EDGE-TYPE CONNECTORS EVALUATED BY
ELECTRICAL NOISE MEASUREMENT
BRUMMETT, S. L. /BOEING CO./ MAY 1967
M-FS-2243

Electrical noise measurement system measures noise generated by edge-type connectors and circuit cards when they are subjected to sinusoidal

vibration. It provides a signal across the contact area and monitors the signal change during vibration. Noise measured can be expressed as a varying change in total contact resistance.

B67-10127
CALIBRATING ULTRASONIC TEST EQUIPMENT FOR CHECKING THIN METAL STRIP STOCK PETERSON, R. M. /AEROJET-GEN. CORP./ JUN. 1967 NUC-10009

C-1009
Calibration technique detects minute laminar-type discontinuities in thin metal strip stock.
Patterns of plastic tape are preselected to include minutely calculated discontinuities and the tape is applied to the strip stock to intercept the incident sonic beam.

B67-10130 MODIFIED UNIVIBRATOR COMPENSATES FOR OUTPUT TIMING ERRORS STRAUSS, M. G. MAY 1967 ARG-85

One-stage, delay compensation amplifier, added to conventional univibrator circuitry time-synchronizes the trailing edge of the output pulse with the origin of the input pulse. The trailing edge is independent of the amplitude of the input pulse.

B67-10135 INTEGRATOR CAN EASILY BE SET AND RESET WITH AN ELECTRONIC SWITCH DEBOO, G. J. MAY 1967 ARC-10002

Electronic switch sets and resets integrator circuit to some initial condition using a grounded capacitor. This circuit also uses four equal resistors and an operational amplifier.

B67-10136
COMPUTER PROGRAM CALCULATES MONOTONIC
MAXIMUM LIKELIHOOD ESTIMATES USING METHOD
OF REVERSALS
ALEXANDER, M. J. /N. AM. AVIATION/ MAY 1967
M-FS-1516

Fortran II computer program calculates maximum estimates of a monotonic non-decreasing response function. The program uses the method of reversals algorithm which applies to the analysis of univariate or multivariate sensitivity experiments.

B67-10137
VARIABLE RELUCTANCE SWITCH AVOIDS CONTACT
CORROSION AND CONTACT BOUNCE
WATSON, P. C. /MIT/ MAY 1967
MSC-1178

Variable reluctance switch avoids contact corrosion and bounce in a hostile environment. It consists of a wire-wound magnetic core and moveable bridge piece that alters the core flux pattern to produce an electrical output useful for switching control media.

B67-10139
RECORDING AND TIME EXPANSION TECHNIQUE FOR HIGH-SPEED, SINGLE-SHOT TRANSIENT VIDEO SIGNAL HRUBY, R. J. SANDER, R. C. MAY 1967
ARC-10003

High-speed, single shot, transient voltage is recorded on a video tape recorder, which, when played back, converts the single signal to a repetitive signal. This drives a sample data translator which lengthens the original transient production time, suiting it to an x-y plotter or computer tape recorder use.

B67-10140
CLAMP PROVIDES EFFICIENT CONNECTION FOR
HIGH-DENSITY CURRENTS
MC CARTHY, J. R. TREBES, D. M. /N. AM. AVIATION/
HAY 1967
M-FS-2417

Electrical connector clamp /bus bar/ gives high contact-surface efficiency for providing a high current to thin well stainless steel tubing containing hydrogen gas. It uses lead solder film to provide the electrical equivalent of a

fusion bond without degrading the grain structure, permitting disassembly and reuse of the components.

B67-10142
THIN FILM PROCESS FORMS EFFECTIVE ELECTRICAL
CONTACTS ON SEMICONDUCTOR CRYSTALS
FORMIGONI, N. P. ROBERTS, J. S. /WESTINGHOUSE
ELEC. CORP./ MAY 1967
M-FS-2343

Process makes microscopic, low-resistance electrical contacts on hexagonal n-type silicon carbide crystals used for microelectronic devices. A vacuum deposition of aluminum is etched to expose the bare silicon carbide where the electrical contacts are made. Sputtering alternating layers of tantalum and gold forms the alloy film.

B67-10143
DESIGN CONCEPTS USING RING LASERS FOR FREQUENCY STABILIZATION
MOCKER, H. /HONEYWELL INC./ MAY 1967
M-FS-2448

Laser frequency stabilization methods are based on a frequency discriminant which generates an unambiguous deviation signal used for automatic stabilization. Closed-loop control stabilizes cavity length at a null point. Some systems have a stabilized ring laser using a piezoelectric dither and others use a Doppler gain tube.

B67-10144
PROCESS FACILITATES PHOTORESIST MASK
ALIGNMENT ON SIC CRYSTALS
FORMIGONI, N. P. ROBERTS, J. S. /WESTINGHOUSE
ELEC. CORP./ MAY 1967
M-FS-2394

Growth of silicon dioxide on a silicon carbide crystal ensures proper orientation of photoresist masks on the crystals used for semiconductor devices. The crystal is heated in a water vapor-saturated gas to delineate p-n junctions that intersect the crystal surface.

B67-10145
TEST INSTRUMENTATION EVALUATES ELECTROSTATIC
HAZARDS IN FLUID SYSTEM
COLLINS, L. H. HENRY, R. KREBS, D. /BOEING CO./
MAY 1967
HES-2027

RJ-1 fuel surface potential is measured with a probe to determine the degree of hazard originating from static electricity buildup in the hydraulic fluid. The probe is mounted in contact with the fluid surface and connected to an electrostatic voltmeter.

B67-10146
HYDROGEN MASER AS A HIGHLY STABLE FREQUENCY
REFERENCE
VANIER, J. VESSOT, R. /VARIAN ASSOC./ MAY 1967
M-FS-2437

Hydrogen maser is stable short— and long-term frequency reference for precision tracking systems. Its resettability is expressed as the rms deviation from the mean.

B67-10150
MULTIPLEXING CONTROL DEVICE ENABLES HANDLING
OF WIDE VARIATIONS IN SAMPLING RATES
INNOVATOR NOT GIVEN. /WESTINGHOUSE ELEC. CORP./
JUN. 1967
M-FS-1871

ESS telecommunication system concept provides the ability to change according to needs indicated by the data without any change to the lunar experiment equipment. The system will include a magnetic core memory as the data multiplexing control device.

B67-10151
ELECTRONIC FREQUENCY DISCRIMINATOR
REID, W. J. /MOTOROLA, INC./ JUN. 1967
H-FS-2434

Digital comparator permits discrimination at accuracy of reference frequency. The compare circuit is a shift register element.

B67-10152
MEANS FOR IMPROVING APPARENT RESOLUTION OF TELEVISION
HILBORN, E. H. MAY 1967
FDC-65

Technique using short term temporal integration characteristics of the observer\*s visual system improves the apparent resolution of television video presentations. The raster is displaced slightly on each frame so the eye can integrate the information in each raster grain. This phase shift uses a switching time delay.

B67-10153 STUDY OF YTTRIUM IRON GARNET RODS REVEALS NEW MAGNETOSTATIC ECHO MODE KEDZIE, R. W. /SPERRY RAND RES. CENTER/ JUN. 1967 ERC-37

Echo mode in YIG rods has different behavior in magnetic fields. This mode, discovered at 8.5 gigahertz, experiences a linear variation. The time delay exhibited is a linear function of the applied magnetic field and the input pulse frequency.

B67-10155
SUBMINIATURE DEFLECTION CIRCUIT OPERATES
INTEGRATED SWEEP CIRCUITS IN TV CAMERA
SCHAFF, F. L. /WESTINGHOUSE ELEC. CORP./ MAY
1967
MSC-1263

Small magnetic sweep deflection circuits operate a hand-held lunar television camera. They convert timing signals from the synchronizer into waveforms that provide a raster on the vidicon target. Raster size remains constant and linear during wide voltage and temperature fluctuations.

B67-10156

VOLTAGE REGULATOR/AMPLIFIER IS SELF-REGULATED DAY, W. E. PHILLIPS, D. E. /COLLINS RADIO CO./MAY 1967
MSC-1240

Signal modulated, self-regulating voltage regulator/amplifier controls the output b+ voltage in modulated regulator systems. It uses self-osciliation with feedback to a control circuit with a discontinuous amplitude action feedback loop.

B67-10157
DESIGN CONCEPT FOR IMPROVED PHOTO-SCAN TUBE
MALLING, L. R. JUN. 1967
JPL-618

Conceptual photo-scan tube avoids complexity of internal beam scanning and beam-current adjustment by optical scan readout. It differs from a conventional image orthicon in its use of an external oscilloscope tube.

B67-10160 A POWER-SPECTRAL-DENSITY COMPUTER PROGRAM CHAPMAN, C. P. JUN. 1967 NPO-10126

Computer program simplifies and clarifies randomnoise vibration test results. It also varies PSD test specifications, sets up automatic equalization equipment, and calculates an exact acceleration level for the random noise prior to the test.

B67-10161
SENSING DISKS FOR SLUG-TYPE CALORIMETERS
HAVE HIGHER TEMPERATURE STABILITY
INNOVATOR NOT GIVEN /SOUTHERN RES. INST./ JUN.
1967
M-FS-1867

Graphite sensing disk for slug-type radiation calorimeters exhibits better performance at high temperatures than copper and nickel disks. The graphite is heat-soaked to stabilize its emittance and the thermocouple is protected from the graphite so repeated temperature cycling does not change its sensitivity.

B67-10162 CLOSED CIRCUIT TV SYSTEM MONITORS WELDING OPERATIONS GILMAN, M. /N. AM. AVIATION/ JUN. 1967 MSC-11002

TV camera system that has a special vidicon tube with a gradient density filter is used in remote monitoring of TIG welding of stainless steel. The welding operations involve complex assembly welding tools and skates in areas of limited accessibility.

B67-10165
HYBRID SOLID STATE SWITCH REPLACES MOTOR-DRIVEN POWER SWITCH
BOOTH, R. A. SCHLOSS, A. I. JUN. 1967
JPL-931

Hybrid solid state switch replaces existing motor-driven power switches used on spacecraft. It uses a transistor circuit to limit the open circuit voltage and allow small relay contacts to handle high transient currents at reasonable cycle life.

B67-10166
EFFICIENT MILLIMETER WAVE /140 GHZ/ DIODE
FOR HARMONIC POWER GENERATION
INNOVATOR NOT GIVEN /ADVAN. TECHNOL. CORP./ JUN.
1967
HO-61

Epitaxial gallium arsenide diode junction formed in a crossed waveguide structure operates as a variable reactance harmonic generator. This varactor diode can generate power efficiently in the low-millimeter wavelength.

B67-10170
DATA RETRIEVAL SYSTEM PROVIDES UNLIMITED
HARDWARE DESIGN INFORMATION
RAWSON, R. D. SWANSON, R. L. /N. AM. AVIATION/
JUN. 1967
BSC-1144

Data is input to magnetic tape on a single format card that specifies the system, location, and component, the test point identification number, the operator\*s initial, the date, a date code, and the data itself. This method is efficient for large volume data storage and retrieval, and permits output variations without continuous program modifications.

B67-10171 STRUCTURAL ANALYSIS AND MATRIX INTERPRETIVE SYSTEM /SAMIS/ INNOVATOR NOT GIVEN /PHILCO CORP./ JUN. 1967 NPO-10130

Structural Analysis and Matrix Interpretive
System eliminates high-speed digital computer
restrictions of lack of generalization and lack of
flexibility. Programming concepts of the system
are standardization, modularity, and programming
for intermediate-size problems.

B67-10175
NUMERICAL DATA FRAME READOUT SYSTEM USED IN
TESTING TELEMETRY SYSTEMS
COTE, C. E. CRESSEY, J. R. JUN. 1967
GSFC-551

Digital telemetry systems are tested by a display system that offers direct leadout as high data rates. The rates appear in numerical format and are adaptable to photographic recording techniques. The system can show bit dropouts at a memory output or locate a malfunction in a system.

B67-10176
THERMAL AND BIAS CYCLING STABILIZES PLANAR
SILICON DEVICES
HARRIS, R. E. MEINHARD, J. E. /N. AM. AVIATION/
JUN. 1967
ERC-48

Terminal burn-in or baking step time in the processing of planar silicon devices is extended to reduce their inversion tendencies. The collector-base junction of the device is also cyclically biased during the burn-in.

B67-10179
A THEORETICAL MODEL FOR DETERMINING TURBINE FLOWMETER SENSITIVITY
SMITH, R. L. /N. AM. AVIATION/ JUN. 1967

M-FS-1172

Analytical model of turbine-type flowmeter guides in the selection of valid extrapolation of available calibration data. An expression for flowmeter performance is developed to include the effects of fluid friction, bearing drag, and magnetic drag upon helical rotor design.

B67-10181
STUDY INDICATES FLUID DIGITAL COMPUTATION
SYSTEMS ARE FEASIBLE
INNOVATOR NOT GIVEN /GE/ JUN. 1967
M-FS-520

Digital computation systems using fluid amplifiers are proven practical. The response speed is adequate for space applications and they are reliable in adverse environments. The systems may be feasible for satellite attitude controls and guidance computers for manned orbital stations.

B67-10190
SWITCHING-TYPE REGULATOR CIRCUIT HAS
INCREASED EFFICIENCY
CLAPP, W. M. /SANDERS ASSOCIATES, INC./ JUN.
1967
MSC-1063

--1003 Switching series regulator circuit uses an inductive network to feed most of the current applied to the control circuit to the load. This circuit eliminates resistive losses and the need for heat sinks.

B67-10192
FAST-ACTING CALORIMETER MEASURES HEAT OUTPUT
OF PLASMA GUN ACCELERATOR
DETHLEFSON, R. LARSON, A. V. LIEBING, L. /GEN.
DYNAMICS/CONVAIR DIV./ JUN. 1967
LEWIS-388

Calorimeter measures the exhaust energy from a shot of a pulsed plasma gun accelerator. It has a fast response time and requires only one measurement to determine the total energy. It uses a long ribbon of copper foil wound around a glass frame to form a reentrant cavity.

B67-10196
TECHNIQUE FOR STRIP CHART RECORDER TIME
NOTATION
INNOVATOR NOT GIVEN /ROBACK CORP./ JUN. 1967
GSFC-473

Single recorder channel helps determine the time an event is recorded on the readout of a strip chart recorder. It presents hours, tens of minutes, and minutes by a unique method of time increment identification. This facilitates recording timing marks.

B67-10199
ELECTROMETER AMPLIFIER OPERATES OVER
DYNAMIC RANGE OF FIVE ORDERS OF MAGNITUDE
KATZ, N. /MARSHALL LAB./ JUN. 1967
ARC-75

Special purpose electrometer amplifier is capable of operation over a dynamic range of five orders of magnitude. This is achieved by using a zener controlled attenuator in the feedback path for the amplifier.

B67-10201
ELECTRONIC CIRCUITRY USED TO AUTOMATE PAPER CHROMATOGRAPHY
STEFFENSEN, G. R. JUN. 1967
JPL-840

Electronic circuit is used in a paper chromatograph instrument that has excellent sensitivity and furnishes a printed record of each test. The circuit measures and records changes in conductivity in a strip of chromatographic paper as different solutions are placed on it.

B67-10205 AUTOMATED MICROSYRINGE IS HIGHLY ACCURATE AND RELIABLE STUART, J. L. JUN. 1967 NPO-10142

Syringe meters small volumes of fluid used in chemical analysis. The standard body and plunger are adapted to fit with a motor driven micrometer,

making a reliable and convenient device.

B67-10204 A CONCEPTUAL, PARALLEL OPERATING DATA COMPRESSION PROCESSOR ANDERSON, T. O. JUN. 1967 NPO-10068

Data compressor processor concept envisions a simplified system for telemetry communications. It is simultaneously a zero-order processor and a floating aperture, a variable aperture, and a binary integer aperture with a decoded buffet fullness counter.

B67-10205 QUARTZ CRYSTALS DETECT GAS CONTAMINANTS DURING VACUUM CHAMBER EVACUATION STEPHENS, J. B. JUN. 1967 NPO-10144

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Piezoelectric quartz crystals detect condensable gas contaminants backstreaming into a vacuum chamber when a pump is evacuating the chamber. One crystal acts as a thermometer, the other detects mass change. They are energized by electronic equipment which records frequency changes.

B67-10206
PLOTTER DESIGN SIMPLIFIES DETERMINATION OF IMAGE SENSOR TRANSFER CHARACTERISTIC BAKER, L. R. JUN. 1967
NPO-10164

Transfer characteristic of vidicons and other image sensors are measured by light from a calibrated electroluminescent panel as a function of the current output of the image sensor. The plot of current output versus the calibrated light output is the transfer characteristic.

B67-10213
FM CARRIER DEVIATION MEASURED BY
DIFFERENTIAL PROBABILITY METHOD
DAQUIN, A. F., JR. HADDICAN, J. /BOEING CO./
JUN. 1967
M-FS-2166

Differential probability FM system measures deviation of a carrier modulated by a complex signal. The peak-to-peak amplitude is measured and related to the frequency shift of the carrier signal. The deviation is described in terms of a probability as well as a peak value.

B67-10215
RUN NUMBERING SYSTEM FOR USE WITH DATA RECORDERS
PEASE, L. L. /BOEING CO./ JUN. 1967
M-FS-2557

Run numbering identification system provides a permanent identification on the recorder traces of data runs. It automatically enters, by pulse coding, the number of the current data run on the recorder trace. The system uses a keyboard, registers, converters, amplifiers, and a pulse generator.

#### **02** PHYSICAL SCIENCES (ENERGY SOURCES)

B67-10008
POLAROID FILM HELPS LOCATE OBJECTS IN
INACCESSIBLE AREAS QUICKLY
GRIFFIN, H. G. MC CLELLAND, G. W. /N. AM.
AVIATION/ JAN. 1967

Polaroid film is used with conventional portable X-ray equipment to locate and shoot items or objects in difficult areas. Polaroid film development time is about 20 seconds.

B67-10021
POLARIMETER PROVIDES TRANSIENT RESPONSE
IN NANOSECOND RANGE
JOHNSTON, A. R. FEB. 1967
JPL-890

Conventional polarimeter with a Senarmont compensator improves transient response and eliminates manual manipulation. A sampled

photomultiplier output is fed to a low pass filter, resulting in a signal representing the optical state existing at the instant of sampling. With this technique, an unknown transient-induced retardation can be measured.

B67-10024
PLASMA JET ELECTRODE HAS LONGER OPERATING
LIFE
GRACEY, C. M. /AEROJET GEN. CORP./ FEB. 1967
NU-0098

Water-cooled, silver-infiltrated tungsten electrode has twice the operating lifetime of the pure tungsten electrode used in plasma jet generators. This electrode reduces the erosion rate, ensures excellent heat transfer, and reduces thermal stresses.

B67-10036
NEUTRON ACTIVATION ANALYSIS TRACES COPPER
ARTIFACTS TO GEOGRAPHICAL POINT OF ORIGIN
CONWAY, M. FIELDS, P. FRIEDMAN, A. KASTNER, M.
METTA, D. MILSTED, J. OLSEN, E. MAR. 1967
ARG-119

Impurities remaining in the metallic copper are identified and quantified by spectrographic and neutron activation analysis. Determination of the type of ore used for the copper artifact places the geographic point of origin of the

B67-10037
CORRELATION ESTABLISHED BETWEEN HEAT TRANSFER AND ULTRASONIC TRANSMISSION PROPERTIES OF COPPER BRAZE BONDS DINOVI, R. A. MAR. 1967 SEE ALSO ANL-7074 ARG-247

Measuring and correlating the thermal conductivity and ultrasonic transmission of seven hot-brazed-bonded copper plates established a relationship between heat transfer and ultrasonic transmission properties of the bonds. This relationship permits the prediction of heat transfer characteristics from ultrasonic transmission tests.

B67-10054
METHOD ACCURATELY MEASURES MEAN PARTICLE
DIAMETERS OF MONODISPERSE POLYSTYRENE
LATEXES
KUBITSCHEK, H. E. MAR. 1967
ARG-207

Photomicrographic method determines mean particle diameters of monodisperse polystyrene latexes. Many diameters are measured simultaneously by measuring row lengths of particles in a triangular array at a glass-oil interface. The method provides size standards for electronic particle counters and prevents distortions, softening, and flattening.

B67-10057
MECHANISMS OF SUPERCONDUCTIVITY
INVESTIGATED BY NUCLEAR RADIATION
AUTLER, S. H. COFFEY, H. T. KELLER, E. L.
PATTERSON, A. MAR. 1967
M-FS-1944

Investigation focused on the behavior of superconducting magnet and its constituent materials during and after exposure to nuclear radiation. The results will indicate the feasibility of their use in diverse applications and various environments.

B67-10068
STUDY MADE OF INTERACTION BETWEEN SOUND
FIELDS AND STRUCTURAL VIBRATIONS
LYON, R. H. SMITH, P. W., JR. /BOLT, BERANEK,
AND NEWMAN/ APR. 1967

Study analyzes structral vibrations and the interactions between them and sound fields. It outlines a conceptual framework to analyze the vibrations of systems and their interactions, incorporating the results of earlier studies and establishing a unified basis for continuing research.

B67-10071
ELECTRONIC FILTER DISCRIMINATES BETWEEN
TRUE AND FALSE REFLECTIONS
MERCHANT, J. /HONEYWELL INC./ APR. 1967
HQ-55

Electronic filtering system discriminates between true corneal and false reflections, solving the problem of spurious reflections of the CRT light in newly designed oculometer.

B67-10072
AN IMPROVED SOFT X-RAY PHOTOIONIZATION DETECTOR
STOBER, A. K. YOUNG, R. M. APR. 1967
GSFC-540

Photoionization detector with an alumina shell, a beryllium foil window, and a xenon gas fill measures small incident photon fluxes from soft X-rays. It has high spectral selectivity and quantum efficiencies, and a long shelf life. It minimizes electrical leakage and recontamination, and will hold a high vacuum.

B67-10076
STUDY MADE OF FAR INFRARED SPECTRA OF
SILICATE MINERALS
INNOVATOR NOT GIVEN, /ARTHUR D. LITTLE, INC./
APR. 1967
APR-5-1811

Study of mineral in the far infrared region of the spectrum examines the problems and feasibility of remote sensing of the composition of the moon or tenuous atmosphere planets. Most of the work described utilized reflection techniques.

B67-10082 FATIGUE ZONES IN METALS IDENTIFIED BY POLARIZED LIGHT PHOTOGRAPHY WALSH, F. D. /BOEING CO./ APR. 1967 WOO-286

Polarized light technique clearly defines the fatigue zones in metal for measuring and photographing. White light is passed through a vertical polarizing filter and then is reflected onto the surface of the fracture specimen.

B67-10088
EXPERIMENTAL SCALING STUDY OF FLUID
AMPLIFIER ELEMENTS
ABLER, J. GREBER, I. TAFT, C. /CASE INST. OF
TECH./ APR. 1967
M-FS-1882

Study examines scaling parameters of three fluid amplifier elements — a bistable device, a boundary layer control device, and a vortex device. Variations in performance due to size, fluid, and other conditions are studied. Even with restricted examples the large number of variables impedes the establishment of these scaling laws.

B67-10109
SPECIAL PURPOSE REFLECTOMETER USES MODIFIED
ULBRICHT SPHERE
GORSTEIN, M. /MIT/ MAY 1967
MSC-1135

Modified Ulbricht sphere measures stray radiation caused by irregularities in the reflective surface of an optical test specimen. The test specimen is positioned between a light source and exit port and all diffusely scattered radiation is measured by a photomultiplier tube in the sphere.

B67-10110
STAR/HORIZON SIMULATOR USED TO TEST SPACE
GUIDANCE SYSTEM
SCHMIDT, W. C. /MIT/ MAY 1967
MSC-407

Star/horizon simulator is used for alignment and optical plus photoelectric tests of the sextant for the Apollo guidance and navigation system Optical Unit Assembly. The unit is basically a refractive collimator with a two- inch objective lens system and a twenty-four- inch focal length.

B67-10120
VISUAL ATTITUDE ORIENTATION AND ALIGNMENT
SYSTEM
BEAM, R. A. MORRIS, D. B. /N. AM. AVIATION/ MAY
1967

MSC-647

Active vehicle optical alignment aid and a passive vehicle three-dimensional alignment target ensure proper orientation and alignment plus control of the closure range and rate between two bodies, one in controlled motion and one at rest.

B67-10126 HIGH-ENERGY-RATE MAGNETOHYDRAULIC METAL FORMING SYSTEM INNOVATOR NOT GIVEN /ADVAN. KINET./ MAY 1967 M-FS-2142

In the magnetohydraulic metal forming system, a sonic shock wave is generated in a liquid medium by a coil energized by an electrical discharge. These waves transfer energy from a metal disphragm, actuated by a pulsed magnetic field, to a metal workpiece. In this development a study was made of the pressure- pulse phenomenon in a liquid medium.

B67-10128 IMPROVED CRYOGENIC REFRIGERATION SYSTEM HIGA, W. H. MAY 1967 JPL-731

Two-position shuttle valve simplifies valving arrangement and crank-shaft configuration in ges-balancing and Stirling-cycle refrigeration systems used to produce temperatures below 173 degrees K. It connects the displacer and regenerator alternately to the supply line or the return line of the compressor, and establishes constant pressure on the drive piston.

B67-10131 NEUTRON DIFFRACTOMETER ALLOWS BOTH MAGNETIC AND CRYSTALLOGRAPHIC ANALYSES ATOJI, M. JUN. 1967 SEE ALSO ANL-6920 ARG-191

Automatic double-crystal neutron diffractometer performs both crystal and magnetic structural analyses. This shielded installation has a goniometric turntable and electronic controls, and auxiliary equipment including a goniometer, diffraction electromagnet, two cryogenic dewars, and two diffraction furnaces.

B67-10134
CRYDGENIC SEAL REMAINS LEAKTIGHT DURING
THERMAL DISPLACEMENT
FIELDS, T. H. MARTIN, K. B. PEWITT, E. G. MAY
1967
ARG-96

Cryogenic seals protect the surfaces of a plastic member in a low-pressure system subjected to extreme temperature changes. The outer seal is an aluminum expansion ring bonded to the lens outer surface and the inner seal consists of a resin-filled aluminum U-ring bonded to the inner surface.

B67-10164

SOLAR X-RAY SPECTRUM REPRODUCED IN VACUUM
ERDMAN, C. A. KIRCHNER, L. P. /IIT RES. INST./
JUN. 1967
MSC-228 MSC-1168

Desired low energy X-rays are produced by modifying commercial ion tubes and combining them with standard power supplies and control circuitry. These X-rays have less deviation from the solar X-ray spectrum in energy and intensity.

B67-10216
ELECTRON BEAM WELDER X-RAYS ITS OWN WELDS
RODEN, W. A. /GEN. DYNAMICS/CONVAIR DIV./ JUN.
1967
LEWIS-10111

Beam of an electron beam welder X-rays its own welds, enabling rapid weld quality checks to be made without removing the work from the vacuum chamber. A tungsten target produces X-rays when hit by the beam. They are directed at the weld specimen and recorded on polaroid film.

#### 03 MATERIALS (CHEMISTRY)

B67-10003 NEW ELECTROLYTE MAY INCREASE LIFE OF POLAROGRAPHIC OXYGEN SENSORS ALBRIGHT, C. F. /GARRETT CORP./ JAN. 1967 MSC-1049

Electrolyte increases life on oxygen sensors in a polarograph used for measuring the partial pressure of oxygen in a gas mixture. It consists of a solution of lithium chloride, dimethyl acetamide and water.

B67-10007 COMPOSITES OF POROUS METAL AND SOLID LUBRICANTS INCREASE BEARING LIFE SLINEY, H. E. JAN. 1967 LEWIS-307

Self-lubricating composites of porous nickel and nickel-chromium alloy impregnated with a barium fluoride-calcium fluoride eutectic, and a thin film of solid lubricant increase wear life of load bearing surfaces.

B67-10012
CRYSTAL MICROBALANCE MEASURES CONDENSABLE
MOLECULAR FLUXES
STEPHENS, J. B. JAN. 1967
JPL-845

Quartz crystal quantitatively measures molecular fluxes emanating from and condensing on spacecraft surfaces. Vibrating in a thickness shear mode the crystal is frequency sensitive to changes in mass on its surface and can measure a fractional monolayer of a condensate.

B67-10014
ABRADED CADMIUM-PLATED CABLE CONNECTORS
REPAIRED BY CONVERSION COATING
SIMMONS, J. R. /BOEING CO./ JAN. 1967
M-FS-1424

Conversion coating procedures repairs scratched and abraded cadmium-plated aluminum cable connectors while they are in assembly.

B67-10016
DISPERSION OF BORAX IN PLASTIC IS EXCELLENT
FIRE-RETARDANT HEAT INSULATOR
EVANS, H. HUGHES, J. SCHMITZ, F. JAN. 1967
ARG-5

A mix of borax powder and a chlorinated anhydrous polyester resin yields a plastic composition that is fire-retardant, yields a minimum of toxic gases when heated, and exhibits high thermal insulating properties. This composition can be used as a coating or can be converted into laminated or cast shapes.

B67-10026
BERYLLIUM FLUORIDE FILM PROTECTS BERYLLIUM
AGAINST CORROSION
ODONNELL, P. M. FEB. 1967
LEWIS-363

Film of beryllium fluoride protects beryllium against corrosion and stress corrosion cracking in water containing chloride ion concentrations. The film is formed by exposing the beryllium to fluorine gas at 525 degrees C. or higher and makes beryllium suitable for space applications.

B67-10032
FLUID-BED FLUORIDE VOLATILITY PROCESS
RECOVERS URANIUM FROM SPENT URANIUM ALLOY
FUELS
BARGHUSEN, J. J. CHILENSKAS, A. A. GUNDER
E. HOLMES, J. T. JONKE, A. A. KINCINAS,

PUELS
BARGHUSEN, J. J. CHILENSKAS, A. A. GUNDERSON, G.
E. HOLMES, J. T. JONKE, A. A. KINCINAS, J. E.
LEVITZ, N. M. POTTS, G. L. RAMASWAMI, D.
STETHERS, H. TURNER, K. S. MAR. 1967 SEE ALSO
ANL-6879, ANL-6829, ANL-6830, ANL-6973, ANL-6992,
ANL-6994

Fluid-bed fluoride volatility process recovers uranium from uranium fuels containing either zirconium or aluminum. The uranium is recovered as uranium hexafluoride. The process requires

few operations in simple, compact equipment, and eliminates aqueous radioactive wastes.

B67-10033 HYDRATED MULTIVALENT CATIONS ARE NEW CLASS OF MOLTEN SALT MIXTURES ANGELL, C. A. MAR. 1967 ARG-211

i-211
Electrical conductance and activation energy measurements on mixtures of calcium and potassium nitrate show the hydrated form to be a new class of molten sait. The theoretical glass transition temperature of the hydrate changed inversely to the anhydrous mixture.

B67-10034
TWO TECHNIQUES ENABLE SAMPLING OF FILTERED
AND UNFILTERED MOLTEN METALS
BURRIS, L., JR. PIERCE, R. D. TOBIAS, K. R.
WINSCH, I. O. MAR. 1967 SEE ALSO ANL-7088
ARG-150

G-150
Filtered samples of molten metals are obtained by filtering through a plug of porous material fitted in the end of a sample tube, and unfiltered samples are obtained by using a capillary-tube extension rod with a perforated bucket. With these methods there are no sampling errors or loss of liquid.

B67-10044
IRRADIATED GASES TRANSFERRED WITHOUT
CONTAMINATION OR DILUTION
BONN, J. L. KERN, W. MAR. 1967
LEWIS-278

Vacuum chamber apparatus opens sealed canisters of irradiated gases and transfers the contents without contaminating the surrounding area, diluting or polluting the contained gases. The apparatus consists of the chamber, a valved piping manifold, and a special drill and sealed drilling access.

B67-10049
CRYOGENIC FATIGUE DATA DEVELOPED FOR INCONEL
718
SCHHIDT, E. H. /N. AM. AVIATION/ MAR. 1967
M-FS-702

Data were obtained on the cryogenic fatigue properties of Inconel 718 bar using axial loading and rotating beam fatigue tests. Results also disclosed the fatigue properties of Inconel 718 sheet materials.

B67-10050
ZIRCONIUM ALLOYS WITH SMALL AMOUNTS OF IRON
AND COPPER OR NICKEL SHOW IMPROVED CORROSION
RESISTANCE IN SUPERHEATED STEAM
GREENBERG, S. YOUNGDAHL, C. A. MAR. 1967
ARG-226

Heat treating various compositions of zirconium alloys improve their corrosion resistance to superheated steam at temperatures higher than 500 degrees C. This increases their potential as fuel cladding for superheated-steam nuclear-fueled reactors as well as in autoclaves operating at modest pressures.

B67-10051
STUDY MADE OF CORROSION RESISTANCE OF
STAINLESS STEEL AND NICKEL ALLOYS IN NUCLEAR
REACTOR SUPERHEATERS
GREENBERG, S. HART, R. K. LEE, R. H. RUTHER, W.
E. SCHLUETER, R. R. MAR. 1967
ARG-230

Experiments performed under conditions found in nuclear reactor superheaters determine the corrosion rate of stainless steel and nickel alloys used in them. Electropolishing was the primary surface treatment before the corrosion test. Corrosion is determined by weight loss of specimens after defilming.

B67-10058
ADDITION OF SOLID OXIDIZER INCREASES LIQUID FUEL SPECIFIC IMPULSE
HENDEL, F. J. APR. 1967
JPL-861

Adding soluble solid oxidizers to hydrazine and similar fuels makes them useful in low temperature

bipropellant systems. These oxidizers improve the low specific impulse, high freezing point, low boiling point, and low density of the fuels.

B67-10062
RECOMMENDED VALUES OF THE THERMOPHYSICAL
PROPERTIES OF EIGHT ALLOYS, THEIR MAJOR
CONSTITUENTS AND OXIDES
TOULOUKIAN, Y. S. /PURDUE UNIV./ MAR. 1967
NU-0095

Reference work provides in tabular and graphical form the thermophysical properties of basic alloys, their constituents and oxides. This is useful for personnel who deal with extreme temperature environments.

B67-10069
CONTROLLED FERRITE CONTENT IMPROVES
WELDABILITY OF CORROSION-RESISTANT STEEL
MALIN, C. O. /N. AM. AVIATION/ APR. 1967
M-FS-568

Corrosion-resistant steel that adds restrictions on chemical composition to ensure sufficient ferrite content decreases the tendency of CRES to develop cracks during welding. The equations restricting composition are based on the Schaeffler constitution diagram.

B67-10070
RADIAL FURNACE SHOWS PROMISE FOR GROWING STRAIGHT BORON CARBIDE WHISKERS FEINGOLD, E. /GE/ APR. 1967

Radial furnace, with a long graphite vaporization tube, maintains a uniform thermal gradient, favoring the growth of straight boron carbide whiskers. This concept seems to offer potential for both the quality and yield of whiskers.

B67-10078
PURIFICATION TRAIN PRODUCES ULTRAPURE
HYDROGEN GAS
WALTER, R. J. /N. AM. AVIATION/ APR. 1967
M-FS-1913

Three-stage purification train produces ultrapure hydrogen gas at 1000 psi from K-bottles of high-purity hydrogen. The continuous process incorporates deoxidation and dehydration units and a molecular sieve.

B67-10079
ARYLENESILOXANE COPOLYMERS
BREED, L. W. ELLIOTT, R. L. /MIDWEST RES. INST./
APR. 1967
M-FS-1812

Arylenesiloxane copolymers with regularly ordered structures were discovered during efforts to develop organosilicon polymers. Arylenesilane and siloxane monomers were both synthesized in these experiments.

B67-10083
EFFECTS OF HELIUM AND NITROGEN AS
PRESSURANTS IN NITROGEN TETROXIDE TRANSFER
BIZJAK, F. SIMKIN, D. J. /N. AM. AVIATION/ APR.
1967
MSC-924 MSC-925

Study investigates effects of helium and nitrogen as pressurents in nitrogen tetroxide transfer from one vessel to another at a higher elevation. Results may contribute to creation of new environmental systems and improved oxygen solubility in water to promote fish life.

B67-10089
MATERIALS DATA HANDBOOKS PREPARED FOR
ALUMINUM ALLOYS 2014, 2219, AND 5456, AND
STAINLESS STEEL ALLOY 301
INNOVATOR NOT GIVEN. /SYRACUSE UNIV. RES. INST./
APR. 1967
M-FS-1959 M-FS-1960 M-FS-1961 M-FS-1962

FS-1959 M-FS-1960 M-FS-1961 M-FS-1962
Materials data handbooks summarize all presently known properties of commercially available structural aluminum alloys 2014, 2219, and 5456 and structural stainless steel alloy 301. The information includes physical and mechanical property data and design data presented in tables, illustrations, and text.

B67-10095
IMPROVED CHLORATE CANDLE PROVIDES
CONCENTRATED OXYGEN SOURCE
HAUG, R. D. MYERS, D. A. TANZAR, G. F. /GARRETT
CORP./ MAR. 1967
MSC-1137

Improved chlorate candle is used as a solid, portable source of oxygen in emergency situations. It contains sodium chlorate, iron, barium peroxide, and glass, mixed in powdered form. The oxygen evolves from the decomposition of the sodium chlorate when an ignition pellet is electrically initiated.

B67-10100
SYNTHESIS OF VARIOUS HIGHLY HALOGENATED
MONOMERS AND POLYMERS
HOLLANDER, J. TRISCHLER, F. D. /WHITTAKER CORP./
APR. 1967 SEE ALSO B66-10646
M-FS-2143

Halogenated polyurethane and polycarbonate are synthesized and found to be LOX compatible but dependent upon the type nitrogen bonding.

B67-10102 SIMPLIFIED METHOD INTRODUCES DRIFT FIELDS INTO CELLS GOLDSTEIN, B. RAPPAPORT, P. WYSOCKI, J. J. /RCA/ APR. 1967 GSFC-572

Drift fields are simply introduced into solar cells at low temperatures in short periods. This is done after their rectifying junctions and output contacts are applied.

B67-10112
THERMODYNAMIC PROPERTIES RELATED TO EXPANSION OF TWO-COMPONENT GAS
BIZJAK, F. /N. AM. AVIATION/ APR. 1967
MSC-1133

Theoretical equations were derived from basic thermodynamic equations to relate the thermodynamic properties of a two-component gas mixture to the expansion of the gas during tank ullage blowdown.

B67-10113
NONMOVEN GLASS FIBER MAT REINFORCES
POLYURETHANE ADHESIVE
ROSELAND, L. M. /DOUGLAS AIRCRAFT CO./ MAY 1967
H-F8-2309

Nonwoven glass fiber mat reinforces the adhesive properties of a polyurethane adhesive that fastens hardware to exterior surfaces of aluminum tanks. The mat is embedded in the uncured adhesive. It ensures good control of the bond line and increases the peel strength.

B67-10121
PORTABLE FIXTURE FACILITATES PRESSURE TESTING OF INSTRUMENTATION FITTINGS OLSON, G. A. /BOEING CO./ MAY 1967 M-FS-2032

Portable fixture facilitates pressure testing to detect possible leaks in instrumentation fittings mounted on tank bulkheads. It uses a vacuum cup which seals a pressure regulator adapter around one side of the fitting to be pressure tested. Leakage is detected with a gas sniffer.

B67-10122 EVALUATION OF HIGH TEMPERATURE STRANDED HOOKUP WIRE DONNELLY, J. H. MOORE, H. J., JR. MAY 1967 SEE ALSO NASA-TM-X-53522 M-FS-2478

Tests are performed on wire and insulation materials to determine selection for electronic space assemblies. Wire characteristics of tensile strength, flexibility, conductivity, and general workability are tested. Knowledge of the advantages and limitations of these materials should prevent overspecification.

B67-10124
SILVER PLATING ENSURES RELIABLE DIFFUSION
BONDING OF DISSIMILAR METALS
INNOVATOR NOT GIVEN /BOEING CO./ MAY 1967
M-FS-1975

Dissimilar metals are reliably joined by diffusion bonding when the surfaces are electroplated with silver. The process involves cleaning and etching, anodization, silver striking, and silver plating with a conventional plating bath. It minimizes the formation of detrimental intermetallic phases and provides greater tolerance of processing parameters.

B67-10132 STATIC ELECTRICITY OF POLYMERS REDUCED BY TREATMENT WITH IODINE HERMANN, A. M. LANDEL, R. F. REMBAUM, A. MAY 1967 NPO-10062

Treating organic polymers with iodine improves the electrical conductivity. Diffusion enables products of desired properties to be custom formulated. This eliminates a buildup of static electricity and the need for fillers or bound metal salts.

B67-10133
XENON FLUORIDE SOLUTIONS EFFECTIVE AS
FLUORINATING AGENTS
HYMAN, H. H. QUARTERMAN, L. A. SHEFT, I. MAY
1967
ARG-217

Solutions of xenon fluorides in anhydrous hydrogen fluoride have few disruptive effects and leave a residue consisting of gaseous xenon, which can be recovered and refluorinated. This mild agent can be used with materials which normally must be fluorinated with fluorine alone at high temperatures.

B67-10138
STATUS OF ULTRACHEMICAL ANALYSIS FOR
SEMICONDUCTORS
DILTS, R. V. HALL, L. C. /VANDERBILT UNIV./ MAY
1967
M-FS-2254

Status of ultratrace chemical analyses of materials for semiconductors was studied. This study covered atomic absorption spectroscopy, emission spectroscopy, and activation analyses. It makes recommendations to improve sensitivity, reliability and versatility for ultratrace chemical analysis.

B67-10141 STUDY TO MINIMIZE HYDROGEN EMBRITTLEMENT OF ULTRAHIGH-STRENGTH STEELS ELSEA, S. T. FLETCHER, E. E. GROENEVELD, T. P. /BATTELLE MEM. INST./ MAY 1967 M-FS-2455

Hydrogen-stress cracking in high-strength steels is influenced by hydrogen content of the material and its hydrogen absorption tendency.

Non-embrittling cleaning, pickling, and electroplating processes are being studied.

Protection from this hydrogen embrittlement is important to the aerospace and aircraft industries.

B67-10147
DEGREASING OF TITANIUM TO MINIMIZE STRESS
CORROSION
CARPENTER, S. R. /GEN. DYNAMICS/CONVAIR DIV./
MAY 1967
LEWIS-382

Stress corrosion of titanium and its alloys at elevated temperatures is minimized by replacing trichloroethylene with methanol or methyl ethyl ketone as a degreasing agent. Wearing cotton gloves reduces stress corrosion from perspiration before the metal components are processed.

CRACKS IN GLASS ELECTRICAL CONNECTOR
HEADERS REMOVED BY DRY BLASTING WITH FINE
ABRASIVE
ECKERT, R. W. /GEN. DYNAMICS/CONVAIR DIV./ MAY
1967
LEWIS-381

Cracking that causes pressure leakage in glass connector headers can be alleviated by manipulating the pin bridgewire connectors. This initiates the surface and meniscus cracks. Dry blasting the header surface with a fine abrasive then removes the cracks.

B67-10149
COATING PROTECTS MAGNESIUM-LITHIUM ALLOYS
AGAINST CORROSION
INNOVATOR NOT GIVEN /AM. MACHINE AND FOUNDRY CO./
MAY 1967 SEE ALSO NASA-SP-50-68
M-FS-2446

Coating protects newly developed magnesium-lithium alloys against corrosion. The procedure includes heating the ingots in a salt bath and rolling them to the desired sheet thickness. The black coating, which is tough though thin and ductile, is derived mainly from chromium.

B67-10159
HEAT TREATMENT STUDY OF ALUMINUM CASTING ALLOY M45
LOVOY, C. V. JUN. 1967 SEE ALSO B65-10092
M-FS-2397

Study determines the heat treatment cycle of aluminum casting alloy M45 which will increase the strength levels of the alloy while maintaining optimum stress corrosion resistance. Evidence indicates that present production castings are overaged too severely to take full advantage of the strength of the alloy.

B67-10163
EFFECTS OF HEAT INPUT RATES ON T-1 AND T-1A
STEEL WELDS
DAVIS, R. A. OLSEN, H. G. WORDEN, S. W. JUN.
1967 SEE ALSO NASA TM-X-53537
M-FS-2475

Technology of T-1 and T-1A steels is emphasized in investigation of their weld-fabrication. Welding heat input rate, production weldment circumstances, and standards of welding control are considered.

B67-10168
ISOSTATIC COMPRESSION PROCESS CONVERTS
POLYAROMATICS INTO STRUCTURAL MATERIAL
INGHAM, J. D. LAWSON, D. D. OSTRUM, G. K. JUN.
1967
JPL-892

Isostatic compression process compacts certain powdered aromatic polymers into homogeneous materials that can be machined to form useful components, such as bearings. It provides for complete removal of air in the interstitial spaces surrounding the granules of the powdered polymer before the powder is subjected to isostatic compression.

B67-10182 STRESS CALCULATOR SPEEDILY CONVERTS STRAIN DATA CORNETT, D. W. /BOEING CO./ JUN. 1967 M-F5-2021

Stress calculator permits speedy conversion of strain data directly into maximum and minimum stresses and also determines stress direction. The calculator has a movable slide with logarithmic and linear scales, and an information and grid board. Its size is flexible for easy manipulation.

B67-10184
NEW CLASS OF COMPOUNDS HAVE VERY LOW VAPOR
PRESSURES
ANGELL, C. A. GRUEN, D. M. JUN. 1967
ARG-115

Magnesium hexahydrate tetrachlorometallates are 50-volume-percent water, have a high melting point and possess a low vapor pressure. These new compounds are relatively noncorrosive, thermally stable, and water soluble but not hygroscopic. They may have potential applications as cooling fluids.

B67-10185
XENON FLUORIDES SHOW POTENTIAL AS
FLUORINATING AGENTS
CHERNICK, C. L. SHIEH, T. C. YANG, N. C. JUN.
1967
ARG-113

Xenon fluorides permit the controlled addition of

fluorine across an olefinic double bond. They provide a series of fluorinating agents that permit ready separation from the product at a high purity. The reactions may be carried out in the vapor phase.

B67-10186
ALPHA PARTICLE BACKSCATTERING MEASUREMENTS
USED FOR CHEMICAL ANALYSIS OF SURFACES
PATTERSON, J. H. JUN. 1967
ARG-116

Alpha particle backscattering performs a chemical analysis of surfaces. The apparatus uses a curium source and a semiconductor detector to determine the energy spectrum of the particles. This in turn determines the chemical composition of the surface after calibration to known samples.

B67-10187
OXIDE FILM ON METAL SUBSTRATE REDUCED TO FORM METAL-OXIDE-METAL LAYER STRUCTURE YOUNGDAHL, C. A. JUN. 1967
ARG-48

Electrically conductive layer of zirconium on a zirconium—oxide film residing on a zirconium substrate is formed by reducing the oxide in a sodium—calcium solution. The reduced metal remains on the oxide surface as an adherent layer and seems to form a barrier that inhibits further reaction.

B67-10189
IRON SERVES AS DIFFUSION BARRIER IN
THERMALLY REGENERATIVE GALVANIC CELL
CROUTHAMEL, C. E. JUN. 1967
ARG-29

Pure iron or iron-coated diaphragm provides a hydrogen diffusion electrode for a thermally regenerative galvanic cell. It allows the gas to diffuse through its interatomic spaces and resists the corrosive action of the cell environment.

B67-10191
SOLUBILITY DATA ARE COMPILED FOR METALS IN
LIQUID ZINC
DILLON, I. G. JOHNSON, I. JUN. 1967 SEE ALSO
ANL-7083
ARG-149

in 149

Available data is compiled on the solubilities of various metals in liquid zinc. The temperature dependence of the solubility data is expressed using the empirical straight line relationship existing between the logarithm of the solubility and the reciprocal of the absolute temperature.

B67-10194
SEPARATION TECHNIQUE PROVIDES RAPID
QUANTITATIVE DETERMINATION OF CESIUM-137
IN IRRADIATED NUCLEAR FUEL
ELLENBURG, E. J. MC COWN, J. J. /WESTINGHOUSE
ASTRONUCL. LAB./ JUN. 1967
NUC-10047

Potassium cobalt ferrocyanide is used to determine cesium-137 activity in irradiated fuel samples. It preferentially removes cesium from an acid solution of the fuel material. The residue is filtered and analyzed with a gamma spectrometer.

B67-10197
NEW CLASS OF THERMOSETTING PLASTICS HAS
IMPROVED STRENGTH, THERMAL AND CHEMICAL
STABILITY
BURNS, E. A. DUBROW, B. LUBOWITZ, H. R. /TRW
SYSTEMS/ JUN. 1967
LEWIS-10108

New class of thermosetting plastics has high hydrocarbon content, high stiffness, thermal stability, humidity resistance, and workability in the precured state. It is designated cyclized polydiene urethane, and is applicable as matrices to prepare chemically stable ablative materials for rocket nose cones of nozzles.

B67-10208 STUDY MADE OF RANEY NICKEL TECHNOLOGY LEE, W. B. /MARQUADT CORP./ JUN. 1967 M-FS-2054

Raney nickel study indicates that its improved storage life is due to gaseous hydrogen and that

the mechanism of its ignitions is catalytic and due to chemisorbed hydrogen atoms. It shows that reacted Raney nickel powder can be reactivated and can introduce multiple ignitions in a hydrogen cas stream.

B67-10209
POROUS MANDRELS PROVIDE UNIFORM
DEFORMATION IN HYDROSTATIC POWDER
METALLURGY
GRIPSHOVER, P. J. HANES, H. D. /BATTELLE MEM.
INST./ JUN. 1967
M-FS-1972

Porous copper mandrels prevent uneven deformation of beryllium machining blanks. The beryllium powder is arranged around these mandrels and hot isostatically pressed to form the blanks. The mandrels are then removed by leaching.

#### 04 LIFE SCIENCES

B67-10005
DIGITAL COMPUTER PROCESSING OF X-RAY PHOTOS NATHAN, R. SELZER, R. H. JAN. 1967
JPL-792

Digital computers correct various distortions in medical and biological photographs. One of the principal methods of computer enhancement involves the use of a two-dimensional digital filter to modify the frequency spectrum of the picture. Another computer processing method is image subtraction.

B67-10056
ADJUSTABLE HINGE PERMITS MOVEMENT OF KNEE
IN PLASTER CAST
MALEY, W. E. MAR. 1967
M-FS-1756

Metal knee hinge with an adjustable sleeve worn on the outside of a leg cast facilitates movement of the knee joint. This helps eliminate stiffness of the knee and eliminates bulkiness and adjustment difficulty.

B67-10114
INTEGRATED MOBILITY MEASUREMENT AND NOTATION
SYSTEM
ROEBUCK, J. A., JR. /N. AM. AVIATION/ MAY 1967
MSC-726

System for description of movements and positions facilitates design of space suits with more mobility. This measurement and notation system gives concise and unequivocal descriptions, compatible with engineering analysis and applicable to specific needs.

B67-10129
ION EXCHANGE DETERMINES IODINE-131
CONCENTRATION IN AQUEOUS SAMPLES
FAIRMAN, W. D. SEDLET, J. MAY 1967
ARG-208

Inorganic radioiodide in aqueous media is analyzed by separating the radioactive iodine-131 as the iodide ion on a silver chloride column. The activity in the final precipitate may be determined by beta or gamma counting.

B67-10188 URANYL PHTHALOCYANINES SHOW PROMISE IN THE TREATMENT OF BRAIN TUMORS FRIGERIO, N. A. JUN. 1967 SEE ALSO ANL-6910 ARG-100

Processes synthesize sulfonated and nonsulfonated uranyl phthalocyanines for application in neutron therapy of brain tumors. Tests indicate that the compounds are advantageous over the previously used boron and lithium compounds.

B67-10207
SELF-SEALING CLOSURE ENABLES ACCESS TO SEVERAL FLUID CONTAINERS
WHEELER, S. B. JUN. 1967
NPO-10123

Self-sealing closure enables small amounts of specific biochemical solutions to be withdrawn from or added to containers in inaccessible or small spaces. It uses a self-sealing septum of a silicone elastomer through which a hypodermic needle can be inserted.

#### 05 MECHANICAL

B67-10004
MICROMANIPULATION TOOL IS EASILY ADAPTED TO MANY USES
SHLICHTA, P. J. JAN. 1967
JPI-129

A special micromanipulation tool equipped with a plunger mounted in a small tube can be easily adapted to such work operations as cutting, precision clamping, and spot welding of microscopic filaments or other parts. This tool is valuable where extreme steadiness of high magnification is required.

B67-10006
COMPLEX SURFACES PLATED BY THIN-FILM
DEPOSITION IN ONE OPERATION
BUCKLEY, D. H. PRZYBYSZEWSKI, J. S. SPALVINS, T.
JAN. 1967
LEWIS-292

In plating deposits thin film on complex surface in one operation. The ionized materials follow electric lines of force to all points on the objects, uniformly plating the surface from all sides simultaneously.

B67-10010
PROCESS SEQUENCE PRODUCES STRONG, LIGHTWEIGHT
REFLECTORS OF EXCELLENT QUALITY
READER, A. F. RUSSELL, W. E. WERNER, E. A. FEB.
1967
1967
1FMIS-331

Large compound curved surfaces for collecting and concentrating radiation are fabricated by the use of several common machining and forming processes. Lightweight sectors are assembled into large reflectors. With this concept of fabrication, integrally stiffened reflective sectors up to 25 square feet in area have been produced.

B67-10011
ELASTIC GUIDES REDUCE HYSTERESIS EFFECT IN
BELLEVILLE SPRING PACKAGE
MC GLASHAN, F., JR. TOTH, L. R. JAN. 1967
JPL-910

Peripheral support guides that elastically flex with the slight breathing on radial displacement during actuation can greatly reduce the hysteresis present in a Belleville spring package. This technique provides a control device that enhances the precision of pressure regulating valves, pressure switches, of vacuum actuators.

B67-10018
TECHNIQUE CUTS TIME AND COST OF BENDING
JACKETED PIPING
GARDNER, J. N. /N. AM. AVIATION/ FEB. 1967
WSO-333

Technique uses a stiff medium in the annular space between inner and outer pipes of jacketed piping in transfer lines. The process eliminates splitting and welding and makes possible the use of standard pipe-bending tools.

B67-10019
ORBITAL TUBE FLARING SYSTEM PRODUCES TUBING CONNECTORS WITH ZERO LEAKAGE
WILLIAMS, J. R. FEB. 1967
H-FS-2016

An orbital tube flaring system produces tubing connectors with a zero-leak potential needed in high pressure hydraulic and pneumatic systems. The flaring system incorporates a rolling cone and rolling die to closely control flare characteristics.

B67-10023
TESTS SHOW THAT ALUMINUM WELDS ARE IMPROVED BY BEAD REMOVAL HOOD, D. W. /BOEING CO./ FEB. 1967
M-FS-1817

Tests with 2218-T87 aluminum alloy plate indicate improvements in strength, ductility, fatigue properties, and burst pressure result when one or both of the top and bottom weld beads are removed. There is, however, a drop in yield strength. The consistency of test data is considerably improved by weld bead removal.

B67-10039 'SIMPLE PUMP MAINTAINS LIQUID HELIUM LEVEL IN CRYOSTAT BUCHHOLD, T. A. /GE/ MAR. 1967 M-FS-1763

Reciprocating pump maintains a precise level of liquid helium in a cryostat. The pump contains a niobium solenoid armature that is maintained in a superconductive state by the liquid helium.

B67-10043 HIGH SPEED BLOWDOWN SYSTEM PROVIDES RAPID PRESSURE LOSS BRITTAN, H. C. /GEN. DYN./CONVAIR/ MAR. 1967 LEWIS-375

High speed blowdown takes advantage of discretely maintained differential pressures to vent a test chamber from high to ambient pressure with minimum time lag. This technique is advantageous where the use of pyrotechnics is undesirable.

B67-10045
RESISTANCE HEATING RELEASES STRUCTURAL
ADHESIVE
GLEMSER, N. N. /BOEING CO./ MAR. 1967
M-FS-1607

S-1607
Composite adhesive package bonds components together for testing and enables separation when testing is completed. The composite of adhesives, insulation and a heating element separate easily when an electrical current is applied.

B67-10047
VISCO SEAL DESIGN OFFERS ZERO-LEAKAGE AND
WEAR-FREE CHARACTERISTICS
KETOLA, H. N. MC GREW, J. M. /GE/ MAR. 1967 SEE
ALSO NASA-TM-X-52245
WSO-329

Study provides specific design criteria in sealing applications for continuous duty pumps used in bulk liquid transfer. A basic sealing equation predicts visco seal performance in the turbulent regime.

B67-10048
TECHNIQUE FOR STRIPPING TEFLON INSULATED
WIRE
BABB, B. D. /HAYES INTERN. CORP./ MAR. 1967
M-FS-1774

Cryogenic stripping of Teflon insulated wire leaves no residue and produces no physical damage. After the wire is immersed in liquid nitrogen, bent slightly, and returned to room temperature, the Teflon is removed by fingernails or flat-nosed pliers.

B67-10052 LABORATORY ARC FURNACE FEATURES INTERCHANGEABLE HEARTHS ARMSTRONG, J. L. KRUGER, O. L. MAR. 1967 ARG-125

Laboratory arc furnace using rapidly interchangeable hearths gains considerable versatility in casting so that buttons or special shaped castings can be produced. It features a sight glass for observation.

B67-10059
VACUUM CHAMBER IS REMOTELY SEALED BY
EUTECTIC METAL
CORDOVA, R. SACOANE, G. H. /AEROJET-GEN. CORP./
APR. 1967
NU-0091

Vacuum chamber is remotely sealed by a design using metal seal blades which are inserted into a molten eutectic metal by pressurizing an expansion bellows. The process increases allowable manipulations by improving working space and safety factors.

B67-10063 FLUIDIC OSCILLATOR USED AS HUMIDITY SENSOR PROKOPIUS, P. R. MAR. 1967 LEWIS-340

Fluidic oscillator measures the humidity of the hydrogen stream leaving a hydrogen-oxygen fuel cell. The instrument provides continuous readings with a certain speed of response.

B67-10064
NEGATIVE FEEDBACK SYSTEM REDUCES PUMP OSCILLATIONS
ROSENMANN, W. /N. AM. AVIATION/ MAR. 1967
M-FS-1852

External negative feedback system counteracts low frequency oscillations in rocket engine propellant pumps. The system uses a control piston to sense pump discharge fluid on one side and a gas pocket on the other.

B67-10066
HOLDING FIXTURE FACILITATES PIPE THREAD
GAGE MEASUREMENTS
CUPPS, B. HILL, J. /N. AM. AVIATION/ MAR. 1967
M-FS-2009

tholding fixture that holds the thread gage and three wires in the proper relationship facilitates the measurement of the pitch diameter of the tapered threads of a pipe thread gage. Modified, this device can be used to involute spur gears.

B67-10067
ADJUSTABLE, SELF-LOCKING LADDER INCLUDES
OPTIONAL WORK PLATFORM
WEBSTER, R. E. /N. AM. AVIATION/ APR. 1967
M-FS-1922

Height-adjustable ladder with a self-locking platform at its top makes elevated locations more accessible, increases the quantity and size of tools handled there, and decreases the risk of disturbance or damage to components. The retractable platform adapts the ladder to normal use.

B67-10073
COLDPLATE OF PIN FIN DESIGN MAKES EFFICIENT
HEAT EXCHANGER
DYER, W. F. /N. AM. AVIATION/ APR. 1967
MSC-1093

Flat, hollow coldplate that permits the flow of coolant liquid within it removes heat from heat-generating electronic equipment. This coldplate solves usual problems of bulk, weight, and excessive pumping requirements.

B67-10081
RIGID-BODY MOTION EXTRACTED FROM TOTAL
MOTION OF A FLEXIBLE BODY
HOWARD, J. C. APR. 1967
ARC-63

Control system eliminates or reduces flexibility effects on the manual and automatic control of large flexible vehicles. It extracts rigid-body and flexible-body motion and adapts well when a flexible-body frequency coincides or nearly coincides with the control mode frequency.

B67-10094
ULTRASONICS PERMITS BRAZING COMPLEX STAINLESS
STEEL ASSEMBLY WITHOUT FLUX
BAKER, W. H. /WESTINGHOUSE ASTRONUCL. LAB./ APR.
1967
NU-0115

Ultrasonic vibration of an assembly of stainless steel instrumentation tubes ensures brazing without flux. Vibration with an ultrasonic transducer permits the brazing material to flow down each tube in contact with a seal plug installed in a pressure vessel wall.

867-10096 UNDERCOAT PREVENTS BLISTERING OF SILVER PLATING AT ELEVATED TEMPERATURES KUSTER, C. A. /N. AM. AVIATION/ APR. 1967 M-FS-2049

Gold undercoat prevents blistering in the silver plating of Inconel 718 seals from steam at high temperatures. The undercoat is diffused into the surface of the parent metal by baking prior to silver plating.

B67-10098
TOROIDAL RING PREVENTS GAS IGNITION AT VENT STACK OUTLET
SPRING, T. R. /N. AM. AVIATION/ APR. 1967
M-FS-2042

Torodial ring welded to the vent stack outlet prevents static discharges which ignite combustible gases in a venting system. The ring inhibits the flow of current by removing the cause of turbulence characteristics of a sharply defined vent exit.

B67-10105
TOOL FACILITATES INSTALLATION OF MARMON
CLAMPS
PETERS, G. A. WARMING, K. /N. AM. AVIATION/ MAY
1967
N-FS-2039

Adjustable tool facilitates the installation of Marmon clamps. It provides sufficient mechanical advantage to force the clamps into place, permitting one man operation. Two handles provide the major leverage, and a pivoting arm with a slot enables snap-out action.

B67-10107 COMPOSITE WELD ROD CORRECTS INDIVIDUAL FILLER WEAKNESSES GRIMALDO, S. /N. AM. AVIATION/ MAY 1967 M-FS-1923

Composite filler wire welds together an assembly made from components of Rene 41 nickel base alloy. Using equal parts of Rene 41 and Hastelloy W weld wire in the filler reduces the cracking and weaknesses of the individual parent metals.

B67-10117 INVESTIGATION OF PRESSURIZED TOROIDAL SHELLS INNOVATOR NOT GIVEN /MARTIN CO./ MAY 1967 SEE ALSO NASA-CR-261 H0-27

The effect of internal pressure and external load on thin-walled toroidal shells was investigated. The result of the analysis agreed with experimental results on a 54-inch-diameter toroidal shell subjected to both pressurization and axial loading.

B67-10123 LOCK-DISCONNECT MECHANISM GIVES POSITIVE RELEASE TO JOINED BODIES BEAVER, C. E. /BOEING CO./ MAY 1967 M-FS-2147

Umbilical system mechanism locks and unlocks through an internal collet device that is controlled by a single reciprocating shaft. The reduction in the number of operational parts results in higher reliability.

B67-10154
ASPIRATOR INCREASES RELIEF VALVE POPPET
STROKE
BIDDLE, M. E. /N. AM. AVIATION/ MAY 1967
HQ-77

Addition of an aspirator to a relief valve increases the valve poppet stroke under dynamic flow conditions. The aspirator allows poppet inlet dynamic forces to overcome relief valve spring force. It reduces the fluid pressure in the skirt cavity by providing a low pressure sense probe.

B67-10158
SINGLE WRENCH SEPARATES NUTS FROM FREEFLOATING BOLTS
THOMPSON, C. /WESTINGHOUSE ASTRONUCL. LAB./ MAY
1967
NUC-10013

Pneumatic impact wrench removes the nuts from freely turning bolts when the heads cannot be reached or the shafts anchored. It uses a fixed screwdriver blade that fits a slot cut into the threaded end of the bolt shaft.

B67-10167 HYDROSTATIC FORCE USED TO HANDLE OUTSIZED, HEAVY OBJECTS
CRAFT, G. W. STARKEY, A. W. /BELLCOMM. INC./
JUN. 1967
HQ-90

Specially fitted barge is used to load and transport large, heavy objects to a dock side site. There the barge itself can lift, rotate, and position the objects. Typical functions are economically accomplished by water buoyancy.

B67-10174 SCANNING MEANS FOR CASSEGRAINIAN ANTENNA GIANDOMENICO, A. RUSCH, W. V. T. JUN. 1967 JPL-946

Mechanical antenna beam switching device detects weak signals over atmospheric and equipment noise sources in microwave antennas. It periodically nutates the paraboloidal subdish in a Cassegrainian reflector system.

B67-10177
EFFECT OF WELDING POSITION ON POROSITY
FORMATION IN ALUMINUM ALLOY WELDS
HARYUNG, J. WROTH, R. S. /DOUGLAS AIRCRAFT/
JUN. 1967
M-FS-2318

Program investigates the effects of varied welding positions on weld qualities. Progressive changes in bead geometry occur as the weld plane angle is varied from upslope to downslope. The gravitational effect on the weld puddle varies greatly with welding position.

B67-10178
FIXTURE FACILITATES HELIUM LEAK TESTING OF
PIPE WELDS
RONEY, J. A. /HAYES INTERN. CORP./ JUN. 1967
M-FS-2167

Fixture facilitates inspection testing of circumferential pipe welds for vacuum tightness, using helium gas as a leakage tracer in conjunction with a mass spectrometer. It consists of a split rubber torus and a mating clamping ring with a vacuum hose fitting.

B67-10180
WORK PLATFORM IS SUPPORTED BY SELF-LOCKING BLADES
RUDDEROW, T. /N. AM. AVIATION/ JUN. 1967
M-FS-2297

Work platform has a supporting plate to engage the deck edge of the supporting structure when lowered into place. The plate is attached to blades hinged to the platform, rigidly supporting the platform when latched, and allowing the platform to be moved away when unlatched.

B67-10183
CONTINUOUS INTERNAL CHANNELS FORMED IN ALUMINUM FUSION WELDS
GAULT, J. SABO, W. /N. AM. AVIATION/ JUN. 1967
M-FS-2399

Process produces continuous internal channel systems on a repeatable basis in 2014-T6 aluminum. Standard machining forms the initial channel, which is filled with tungsten carbide powder. TIG machine fusion welding completes formation of the channel. Chem-mill techniques enlarge it to the desired size.

B67-10195
WELD PROCEDURE PRODUCES QUALITY WELDS FOR
THICK SECTIONS OF HASTELLOY-X
FLENS, F. J. FLETCHER, C. W. GLASIER, L. F., JR.
/AEROJET GEN./ JUN. 1967
NUC-10048

Welding program produces premium quality, multipass welds in heavy tube sections of Hastelloy-X. It develops semiautomatic tungsten/inert gas procedures, weld wire procurement specifications, material weld properties, welder-operator training, and nondestructive testing inspection techniques and procedures.

B67-10198 GLASS BEAD SHOT PEENING RETARDS STRESS CORROSION FAILURE OF TITANIUM TANKS BALES, T. T. LISAGOR, W. B. MANNING, C. R. SEYFFORT, M. B. JUN. 1967 LANGLEY-319

Rigidly controlled shot peening retards the incompatibility between titanium alloys and nitrogen tetroxide in rocket-propellant storage tands. This sets up a residual compressive stress in the surface of a material which reduces tensile stresses in the material fibers, alleviating stress corrosion.

B67-10200
WORKMANSHIP STANDARDS FOR FUSION WELDING
PHILLIPS, M. D. /AEROJET GEN./ JUN. 1967
NUC-10050

Workmanship standards manual defines practices, that adhere to rigid codes and specifications, for fusion welding of component piping, assemblies, and systems. With written and pictorial presentations, it is part of the operating procedure for fusion welding.

B67-10202

APPARATUS FOR FABRICATION OF AMERICIUMBERYLLIUM NEUTRON SOURCES PREVENTS CAPSULE
CONTAMINATION
HOHR, W. C. VAN LOOM, J. A. JUN. 1967
ARG-184

Modified gloved enclosure is used to fill a capsule with a mixture of americium and beryllium radioactive powders to seal weld the opening, and to test it for leaks. It contains a horizontal partition, vortex mixer, mounting press, welder, test vessel, and radiation shielding to prevent surface contamination.

B67-10210 ENVIRONMENTAL STUDY OF MINIATURE SLIP RINGS RADNIK, J. L. /IIT RES. INST./ JUN. 1967 M-FS-2443

Investigation studied the long term operation of miniature slip ring assembles in high vacuum of space and included the influence of ring, brush, and insulator materials on electrical noise and mechanical wear. Results show that soft metal vapor plating and niobium diselenide miniature slip rings are beneficial.

B67-10211 HIGH-STRENGTH BRAZE JOINTS BETWEEN COPPER AND STEEL KUHN, R. F. /N. AM. AVIATION/ JUN. 1967 H-FS-2519

High-strength braze joints between copper and steel are produced by plating the faying surface of the copper with a layer of gold. This reduces porosity in the braze area and strengthens the resultant joint.

B67-10212
DESIGN CONCEPT TO DECREASE RELATIVE SPEED
OF BALL BEARINGS
JESMAN, S. /N. AM. AVIATION/ MAY 1967
M-FS-2003

Intermediate ring decreases the rolling speed of a ball bearing relative to the rotational speed of the shaft. It has raceways on its inner and outer peripheries and an additional row of balls. The modification permits operation at much higher shaft speeds than usual.

B67-10214
SYSTEM ENABLES DIMENSIONAL INSPECTION OF VERY LARGE STRUCTURES
SIMPSON, R. R. /BOEING CO./ JUN. 1967
M-FS-2477

Precision rotary table with an integrated optical tooling bar system enables accurate and rapid measurement of linear and angular dimensions on very large structures of any configuration. The structure is mounted on the turntable, which can be rotated to expose any desired surface.

#### **06** COMPUTER PROGRAMS

B67-10169
STUDY OF DYNAMIC RESPONSE OF ELASTIC SPACE
STATIONS
KAMRATH, P. /N. AM. AVIATION/ JUN. 1967
NPO-10124

Analytical procedure and the requisite computer programs compute the dynamic responses of two large elastic space stations. The linearized equations of motion are derived from Lagrange\*s equations. Then the normal modes of free vibration of the nonrotating space station are used to define the elastic degrees of freedom.

B67-10172 SPACE TRAJECTORIES PROGRAM FOR IBM 7090 HOLDRIDGE, D. B. JUN. 1967 SEE ALSO 32-223 NPO-10125

Space Trajectories Program studies the motion of a space probe confined to the solar system and influenced by the nonspherical Earth and Moon, and the point masses defined by the Sun, Venus, Mars, and Jupiter. It is written in the Fortran Assembly Program language.

B67-10173 LINEAR CIRCUIT ANALYSIS PROGRAM FOR IBM 1620 MONITOR II, 1311/1443 DATA PROCESSING SYSTEM /CIRCS/ HATFIELD, J. JUN. 1967 NPO-10131

CIRCS is modification of IBSNAP Circuit
Analysis Program, for use on smaller systems.
This data processing system retains the basic dc,
transient analysis, and Fortran II formats. It
can be used on the IBM 1620/1311 Monitor I Mod
5 system, and solves a linear network containing
15 nodes and 45 branches.

B67-10193
COMPUTER PROGRAM SIMULATES PHYSICAL SYSTEMS BY SOLVING THE SIMULTANEOUS DIFFERENTIAL EQUATIONS DESCRIBING THE SYSTEMS MANKOVITZ, R. J. JUN. 1967
NPO-10019

DIANA, a digital-analog simulation program for IBM 1620 II computer, simulates physical systems by solving the simultaneous differential equations describing the systems. It expands and optimizes the input-output capabilities, permits additional flexibility in midstream program alternation, and minimizes the computational time.

B67-10217
A MODAL COMBINATION COMPUTER PROGRAM FOR DYNAMIC ANALYSIS OF STRUCTURES
BAMFORD, R. M. JUN. 1967
NPO-10129

Computer program determines the response of a composite linear structure to sinusoidal base motion of a restrained structure or sinusoidal forces of a free structure. This program is applied to problems of testing practices and closed-loop stability of autopilot controlled space vehicles. It is written for the IBM 7094 in Fortran IV language.

### SUBJECT INDEX-

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and crystallographic analyses ARG-191	B67-10131	02	thermally regenerative galvanic c		
	20. 10101		ARG-29		03
CURIUM 242 Alpha particle backscattering meas			DIGITAL COMMUNICATIONS SYSTEM		
used for chemical analysis of su			Numerical data frame readout system	used in	
ARG-116	B67-10186	03	testing telemetry systems GSFC-551	B67-10175 0	01
			G5FC-351	B07-10173 0	,,
D			DIGITAL COMPUTER		
DATA COMPRESSOR  A conceptual, parallel operating de			Digital computer processing of X-ra JPL-792		04
compression processor	u . a				•
NPO-10068	B67-10204	01	Study indicates fluid digital compu	tation	
DATA PROCESSING			systems are feasible M-FS-520	B67-10181 0	01
Digital computer processing of X-r					
JPL-792	B67-10005	04	Computer program simulates physical by solving the simultaneous diffe		

equations describing the systems NPO-10019	B67-10193	06	ELECTROLUMINESCENCE Plotter design simplifies determinat	ion of	
	20. 10150	•	image sensor transfer characterist	ic	
DISCONNECT DEVICE  Lock-disconnect mechanism gives pos	itive		NPO-10164	B67-10206	01
release to joined bodies			ELECTROLYTE		
M-FS-2147	B67-10123	05	New electrolyte may increase life of polarographic oxygen sensors		
DISCONTINUITY				B67-10003	03
Calibrating ultrasonic test equipme checking thin metal strip stock	nt for		ELECTROMAGNET		
NUC-10009	B67-10127	01	Neutron diffractometer allows both m	agnetic	
DISPLACEMENT			and crystallographic analyses ARG-191	B67-10131	02
Cryogenic seal remains leaktight du	ring			50, 10101	VL
thermal displacement ARG-96	B67-10134	02	ELECTROMAGNETIC INSTRUMENT High transients suppressed in electr	omegnetic	
MNG-30	DO7-10134	02	devices	Omagnetic	
DISPLAY SYSTEM Numerical data frame readout system	!-		KSC-66-13	B67-10031	01
testing telemetry systems	used In		Improved fluid control circuit opera	ites on	
GSFC-551	B67-10175	01	low power input		01
DRIFT			LEWIS-325	B67-10042	01
Simplified method introduces drift into cells	fields		ELECTROMECHANICAL DEVICE		
GSFC-572	B67-10102	03	Residual magnetism holds solenoid ar in desired position		
DYNAMIC RESPONSE			LEWIS-343	B67-10038	01
Study of dynamic response of elasti-	c space		Instrument continuously measures den	sity	
stations NPO-10124	B67-10169	06	of flowing fluids LEWIS-309	B67-10080	01
	207 10103	•0		207 10000	•-
DYNODE  Electron multiplier has improved			ELECTROMETER Electrometer amplifier operates over	•	
performance and stability			dynamic range of five orders of me	igni tude	
GSFC-546	B67-10060	01	ARC-75	B67-10199	01
E			ELECTROMOTIVE FORCE		
ECHO			Thermoelectric metal comparator detection of alloys and metals	ermines	
Study of yttrium iron garnet rods r	eveals		ARG-235	B67-10035	01
new magnetostatic echo mode ERC-37	B67-10153	01	ELECTRON BEAM WELDING		
DI ACCOMPD			Electron beam welder X-rays its own		02
ELASTOMER Self-sealing closure enables access	to		LEWIS-10111	B67-10216	02
several fluid containers NPO-10123	B67-10207	04	ELECTRON MULTIPLIER		
NFU-10123	807-10207	U- <b>4</b>	Electron multiplier has improved performance and stability		
ELECTRIC CONDUCTIVITY  Hydrated multivalent cations are ne	u alses		GSFC-546	B67-10060	01
of molten salt mixtures			ELECTRONIC EQUIPMENT		
ARG-211	B67-10033	03	Coldplate of pin fin design makes ex heat exchanger	fficient	
Static electricity of polymers redu	ced by		MSC-1093	B67-10073	05
treatment with iodine NPO-10062	B67-10132	03	ELECTRONIC FILTER		
			Electronic filter discriminates bet	ween	
ELECTRIC CONNECTOR			true and false reflections		
Cracks in glass electrical connecto	r			B67-10071	02
Cracks in glass electrical connecto headers removed by dry blasting w			HQ-55	B67-10071	02
		03			02
headers removed by dry blasting w abrasive LEWIS-381	ith fine	03	HQ-55  ELECTRONIC RECORDING INSTRUMENT Technique for strip chart recorder notation	time	
headers removed by dry blasting w abrasive LEWIS-381 ELECTRIC CONTACT Variable reluctance switch avoids c	ith fine B67-10148	03	HQ-55  ELECTRONIC RECORDING INSTRUMENT Technique for strip chart recorder notation GSFC-473		02
headers removed by dry blasting w abrasive LEWIS-381 ELECTRIC CONTACT Variable reluctance switch avoids c corrosion and contact bounce	ith fine B67-10148 ontact		HQ-55  ELECTRONIC RECORDING INSTRUMENT Technique for strip chart recorder notation GSFC-473  ELECTRONIC SWITCH	time B67-10196	
headers removed by dry blasting w abrasive LEWIS-381 ELECTRIC CONTACT Variable reluctance switch avoids c corrosion and contact bounce MSC-1178	ith fine B67-10148 ontact B67-10137	03	HQ-55  ELECTRONIC RECORDING INSTRUMENT Technique for strip chart recorder notation GSFC-473  ELECTRONIC SWITCH Integrator can easily be set and re an electronic switch	time B67-10196 set with	01
headers removed by dry blasting wabrasive LEWIS-381  ELECTRIC CONTACT Variable reluctance switch avoids corrosion and contact bounce MSC-1178  Thin film process forms effective e	ith fine B67-10148  ontact B67-10137		HQ-55  ELECTRONIC RECORDING INSTRUMENT Technique for strip chart recorder notation GSFC-473  ELECTRONIC SWITCH Integrator can easily be set and re	time B67-10196	
headers removed by dry blasting w abrasive LEWIS-381 ELECTRIC CONTACT Variable reluctance switch avoids c corrosion and contact bounce MSC-1178	ith fine B67-10148  ontact B67-10137		HQ-55  ELECTRONIC RECORDING INSTRUMENT Technique for strip chart recorder notation GSFC-473  ELECTRONIC SWITCH Integrator can easily be set and re an electronic switch ARC-10002  Hybrid solid state switch replaces	time B67-10196 set with B67-10135	01
headers removed by dry blasting wabrasive LEWIS-381  ELECTRIC CONTACT  Variable reluctance switch avoids corrosion and contact bounce MSC-1178  Thin film process forms effective e contacts on semiconductor crystal	ith fine B67-10148  ontact B67-10137  lectrical	01	HQ-55  ELECTRONIC RECORDING INSTRUMENT Technique for strip chart recorder notation GSFC-473  ELECTRONIC SWITCH Integrator can easily be set and re an electronic switch ARC-10002  Hybrid solid state switch replaces driven power switch	time B67-10196 set with B67-10135	01
headers removed by dry blasting wabrasive LEWIS-381  ELECTRIC CONTACT  Variable reluctance switch avoids corrosion and contact bounce MSC-1178  Thin film process forms effective e contacts on semiconductor crystal M-FS-2343  ELECTRIC CURRENT Clamp provides efficient connection	ith fine  B67-10148  ontact  B67-10137  lectrical  B67-10142	01	HQ-55  ELECTRONIC RECORDING INSTRUMENT Technique for strip chart recorder notation GSFC-473  ELECTRONIC SWITCH Integrator can easily be set and re an electronic switch ARC-10002  Hybrid solid state switch replaces driven power switch JPL-931	time B67-10196 set with B67-10135 motor-	01
headers removed by dry blasting wabrasive LEWIS-381  ELECTRIC CONTACT Variable reluctance switch avoids corrosion and contact bounce MSC-1178  Thin film process forms effective e contacts on semiconductor crystal M-FS-2343  ELECTRIC CURRENT	ith fine  B67-10148  ontact  B67-10137  lectrical  B67-10142	01	HQ-55  ELECTRONIC RECORDING INSTRUMENT Technique for strip chart recorder notation GSFC-473  ELECTRONIC SWITCH Integrator can easily be set and re an electronic switch ARC-10002  Hybrid solid state switch replaces driven power switch	time  B67-10196  set with  B67-10135  motor-  B67-10165	01
headers removed by dry blasting wabrasive LEWIS-381  ELECTRIC CONTACT Variable reluctance switch avoids corrosion and contact bounce MSC-1178  Thin film process forms effective e contacts on semiconductor crystal M-FS-2343  ELECTRIC CURRENT Clamp provides efficient connection high-density currents M-FS-2417	ith fine B67-10148 ontact B67-10137 lectrical B67-10142	01	HQ-55  ELECTRONIC RECORDING INSTRUMENT Technique for strip chart recorder notation GSFC-473  ELECTRONIC SWITCH Integrator can easily be set and re an electronic switch ARC-10002  Hybrid solid state switch replaces driven power switch JPL-931  ELECTROPLATING Silver plating ensures reliable dif bonding of dissimilar metals	time  B67-10196  set with  B67-10135  motor-  B67-10165  fusion	01
headers removed by dry blasting wabrasive LEWIS-381  ELECTRIC CONTACT Variable reluctance switch avoids corrosion and contact bounce MSC-1178  Thin film process forms effective econtacts on semiconductor crystal M-FS-2343  ELECTRIC CURRENT Clamp provides efficient connection high-density currents M-FS-2417  ELECTRIC MEASUREMENT Edge-type connectors evaluated by	ith fine B67-10148 ontact B67-10137 lectrical B67-10142	01	HQ-55  ELECTRONIC RECORDING INSTRUMENT Technique for strip chart recorder notation GSFC-473  ELECTRONIC SWITCH Integrator can easily be set and re an electronic switch ARC-10002  Hybrid solid state switch replaces driven power switch JPL-931  ELECTROPLATING Silver plating ensures reliable dif	time  B67-10196  set with  B67-10135  motor-  B67-10165	01
headers removed by dry blasting wabrasive LEWIS-381  ELECTRIC CONTACT Variable reluctance switch avoids corrosion and contact bounce MSC-1178  Thin film process forms effective e contacts on semiconductor crystal M-FS-2343  ELECTRIC CURRENT Clamp provides efficient connection high-density currents M-FS-2417  ELECTRIC MEASUREMENT Edge-type connectors evaluated by electrical noise measurement	ith fine B67-10148 ontact B67-10137 lectrical B67-10142 for B67-10140	01 01 01	ELECTRONIC RECORDING INSTRUMENT Technique for strip chart recorder notation GSFC-473  ELECTRONIC SWITCH Integrator can easily be set and re an electronic switch ARC-10002  Hybrid solid state switch replaces driven power switch JPL-931  ELECTROPLATING Silver plating ensures reliable dif bonding of dissimilar metals M-FS-1975  ELECTROSTATIC CHARGING	time B67-10196 set with B67-10135 motor- B67-10165 fusion B67-10124	01
headers removed by dry blasting wabrasive LEWIS-381  ELECTRIC CONTACT Variable reluctance switch avoids corrosion and contact bounce MSC-1178  Thin film process forms effective econtacts on semiconductor crystal M-FS-2343  ELECTRIC CURRENT Clamp provides efficient connection high-density currents M-FS-2417  ELECTRIC MEASUREMENT Edge-type connectors evaluated by electrical noise measurement M-FS-2243	ith fine B67-10148 ontact B67-10137 lectrical B67-10142 for	01	ELECTRONIC RECORDING INSTRUMENT Technique for strip chart recorder notation GSFC-473  ELECTRONIC SWITCH Integrator can easily be set and re an electronic switch ARC-10002  Hybrid solid state switch replaces driven power switch JPL-931  ELECTROPLATING Silver plating ensures reliable dif bonding of dissimilar metals M-FS-1975  ELECTROSTATIC CHARGING Test instrumentation evaluates elect hazards in fluid system	time  B67-10196  set with  B67-10135  motor-  B67-10165  fusion  B67-10124	01 01 03
headers removed by dry blasting wabrasive LEWIS-381  ELECTRIC CONTACT Variable reluctance switch avoids corrosion and contact bounce MSC-1178  Thin film process forms effective econtacts on semiconductor crystal M-FS-2343  ELECTRIC CURRENT Clamp provides efficient connection high-density currents M-FS-2417  ELECTRIC MEASUREMENT Edge-type connectors evaluated by electrical noise measurement M-FS-2243  ELECTROHYDRAULIC FORMING	ith fine  B67-10148  ontact  B67-10137  lectrical  B67-10142  for  B67-10140	01 01 01	ELECTRONIC RECORDING INSTRUMENT Technique for strip chart recorder notation GSFC-473  ELECTRONIC SWITCH Integrator can easily be set and re an electronic switch ARC-10002  Hybrid solid state switch replaces driven power switch JPL-931  ELECTROPLATING Silver plating ensures reliable dif bonding of dissimilar metals M-FS-1975  ELECTROSTATIC CHARGING Test instrumentation evaluates elect	time B67-10196 set with B67-10135 motor- B67-10165 fusion B67-10124	01
headers removed by dry blasting wabrasive LEWIS-381  ELECTRIC CONTACT Variable reluctance switch avoids corrosion and contact bounce MSC-1178  Thin film process forms effective econtacts on semiconductor crystal M-FS-2343  ELECTRIC CURRENT Clamp provides efficient connection high-density currents M-FS-2417  ELECTRIC MEASUREMENT Edge-type connectors evaluated by electrical noise measurement M-FS-2243	ith fine  B67-10148  ontact  B67-10137  lectrical  B67-10142  for  B67-10140	01 01 01	ELECTRONIC RECORDING INSTRUMENT Technique for strip chart recorder notation GSFC-473  ELECTRONIC SWITCH Integrator can easily be set and re an electronic switch ARC-10002  Hybrid solid state switch replaces driven power switch JPL-931  ELECTROPLATING Silver plating ensures reliable dif bonding of dissimilar metals M-FS-1975  ELECTROSTATIC CHARGING Test instrumentation evaluates elect hazards in fluid system	time  B67-10196  set with  B67-10135  motor-  B67-10165  fusion  B67-10124  trostatic  B67-10145	01 01 01

M-FS-2455	B67-10141	03	FEEDBACK CONTROL SYSTEM		
EMITTER			System maintains constant penetration during fusion welding	n	
Double emitter suppressed carrier w				B67-10091	01
uses commercially available compo M-FS-2494	B67-10101	01	FEEDING DEVICE		
ENCAPSULATION			Feed-through connector couples RF po vacuum chamber	wer into	
RF inductor has high Q, is stable a	at .			B67-10027	01
higher temperatures JPL-1019	B67-10106	01	FERRITE		
ENERGY	•		Controlled ferrite content improves		
Fast-acting calorimeter measures he	eat output		weldability of corrosion-resistant M-FS-568	t steel B67-10069	03
of plasma gun accelerator LEWIS-388	B67-10192	01	FILTRATION		
	807-10192	01	Two techniques enable sampling of fi	ltered	
ENERGY LEVEL Solar X-ray spectrum reproduced in	Vacuus		and unfiltered molten metals ARG-150	B67-10034	03
MSC-228	B67-10164	20		DO7 10054	••
ENVIRONMENTAL TESTING			FIRE CONTROL Dispersion of borax in plastic is ex	cellent	
Environmental study of miniature si			fire-retardant heat insulator		
M-FS-2443	B67-10210	05	ARG-5	B67-10016	03
EQUIPMENT SPECIFICATIONS Integrated mobility measurement and	i notation		FLAW DETECTION  Calibrating ultrasonic test equipmen		
system			checking thin metal strip stock	it for	
MSC-726	B67-10114	04	NUC-10009	B67-10127	01
ERROR CORRECTING DEVICE			FLEXIBLE BODY		
Automatic channel switching device MSC-832	B67-10086	01	Rigid-body motion extracted from tot motion of a flexible body	tal	
EUTECTIC ALLOY			ARC-63	B67-10081	05
Vacuum chamber is remotely sealed t	by		FLOW MEASUREMENT		
eutectic metal NU-0091	B67-10059	05	Local measurements in turbulent flow through cross correlation of optic		
	DOT 10003	00	M-FS-1268	B67-10030	01
EVACUATION  Quartz crystals detect gas contami:	nants		Instrument continuously measures der	nsitu	
during vacuum chamber evacuation			of flowing fluids	•	
NPO-10144	B67-10205	01	LEWIS-309	B67-10080	01
EXPLOSIVE DEVICE Study made of explosive cutting in	eimulated		FLOW METER  A theoretical model for determining	tumbina	
space environments			flowmeter sensitivity		
M-FS-1597	B67-10040	01	M-FS-1172	B67-10179	01
Cracks in glass electrical connecte			Automated microsyringe is highly acc	curate	
headers removed by dry blasting t abrasive	with line		and reliable NPO-10142	B67-10203	01
LEWIS-381	B67-10148	03	FLOW STABILITY		
EXTRACTION			System automatically supplies precis		
Fluid-bed fluoride volatility proce recovers uranium from spent uran			analytical samples of high-pressur M-FS-1814	re gases B67-10090	01
fuels ARG-232		03	FLUID		
ARG-232	B67-10032	U3	Portable detector set discloses heli	ium	
F			leak rates M-FS-1733	B67-10065	01
FASTENER				200	-
Lock-disconnect mechanism gives por release to joined bodies	sitive		FLUID AMPLIFIER Improved fluid control circuit opera	ates on	
M-FS-2147	B67-10123	05	low power input LEWIS-325	B67-10042	01
FATIGUE TEST				DO7-10042	01
Cryogenic fatigue data developed for 718	or Inconel		Experimental scaling study of fluid amplifier elements		
H-FS-702	B67-10049	03	M-FS-1882	B67-10088	02
FATIGUE TESTING MACHINE			Study indicates fluid digital compu	tation	
Tester for study of rolling elemen LEWIS-305	t bearings B67-10009	01	systems are feasible M-FS-520	B67-10181	01
Strain gage circuitry provides fat testing machine with accurate cy-	igue cle count		FLUORINATION  Xenon fluoride solutions effective a	as	
NU-0114	B67-10093	01	fluorinating agents ARG-217	B67-10133	03
FEEDBACK				201-10133	vo
Negative feedback system reduces poscillations	ump		Xenon fluorides show potential as fluorinating agents		
M-FS-1852	B67-10064	05	ARG-113	B67-10185	03
Voltage regulator/amplifier is sel	f-regulated		FLUX		
MSC-1240	B67-10156	01	Ultrasonics permits brazing complex steel assembly without flux	stainless	
			NU-0115	B67-10094	05

FORTRAN			GALVANIC CELL		
Computer program reduces calculation	n time		Iron serves as diffusion barrier in		
of normal response functions M-FS-1517	B67-10108	01	thermally regenerative galvanic co ARG-29	211 B67-10189	03
Computer program calculates monoton maximum likelihood estimates using			GAS COOLING SYSTEM Improved cryogenic refrigeration sys		
of reversals	B67-10136	0.5	JPL-731	B67-10128	02
M-FS-1516	DO7-10136	01	GAS EXPANSION		
A modal combination computer program	m for		Thermodynamic properties related to		
dynamic analysis of structures NPO-10129	B67-10217	06	expansion of two-component gas MSC-1133	B67-10112	03
NAD-10152	B67-10217	VO	H2C-1133	807-10112	vo
FRACTURE			GAS EXPLOSION		
Fatigue zones in metals identified   polarized light photography	by		Test instrumentation evaluates electricated in fluid system	trostatic	
WOO-286	B67-10082	02	M-FS-2277	B67-10145	01
ADDA UZDOAGION			440 W 011		
FREE VIBRATION Study of dynamic response of elastic	c space		GAS FLOW  Portable detector set discloses help	í um	
stations	•		leak rates		
NPO-10124	B67-10169	06	M-FS-1733	B67-10065	01
FREQUENCY AMPLIFIER			Toroidal ring prevents gas ignition	at	
Parametric up-converter increases f of maser	lexibility		vent stack outlet M-FS-2042	B67-10098	05
KSC-67-98	B67-10104	01	N-12-24-1	DO7 10030	•
PARAMENAN MARIN ARTAN			Quartz crystals detect gas contamin	ents	
FREQUENCY MODULATION  FM carrier deviation measured by			during vacuum chamber evacuation NPO-10144	B67-10205	01
differential probability method					
M-FS-2166	B67-10213	01	GAS LASER System enables more complete calibr	ation=	
FREQUENCY MULTIPLIER			of dynamic-pressure transducers	attons	
Efficient millimeter wave /140 GHz/	diode		M-FS-2063	B67-10099	01
for harmonic power generation HQ-61	B67-10166	01	GAS MASER		
• -	20. 20200		Hydrogen maser as a highly stable f	requency	
FREQUENCY REGULATOR  Design concepts using ring lasers for	<b></b>		reference M-FS-2437	B67-10146	01
frequency stabilization	01		U-12-5407	DO7 10140	٠.
M-FS-2448	B67-10143	01	GAS PRESSURE		
FREQUENCY RESPONSE			Effects of helium and nitrogen as pressurants in nitrogen tetroxide	transfer	
Voltage regulator/amplifier is self-			MSC-924	B67-10083	03
MSC-1240	B67-10156	01	GAS TRANSPORT		
FREQUENCY STANDARD			Irradiated gases transferred withou	t	
Hydrogen maser as a highly stable f reference	requency		contamination or dilution LEWIS-278	B67-10044	03
M-FS-2437	B67-10146	01	FE#12-510	BO7 10044	•••
EDPOURNAY AVNAURANTALETON			GAS VALVE		
FREQUENCY SYNCHRONIZATION TV synchronization system features			System automatically supplies preci analytical samples of high-pressu		
stability and noise immunity			M-FS-1814	B67-10090	01
JPL-915	B67-10118	01	GAUGE		
FUEL CELL			Holding fixture facilitates pipe th	read	
Fluidic oscillator used as humidity LEWIS-340	sensor B67-10063	05	gage measurements M-FS-2009	B67-10066	05
TC#19-040	B07-10003	45	H-12-5003	DO7 10000	•••
FURNACE Laboratory arc furnace features			GENERATOR Plasma jet electrode has longer ope	nating	
interchangeable hearths			life	racing	
ARG-125	B67-10052	<b>Q</b> 5	NU-0098	B67-10024	02
Radial furnace shows promise for gr	owina		GLASS FIBER		
straight boron carbide whiskers			Nonwoven glass fiber mat reinforces	J	
HQ-50	B67-10070	03	polyurethane adhesive M-FS-2309	B67-10113	03
FUSION WELDING				20. 10110	
System maintains constant penetrati during fusion welding	on		GOLD Thin film process forms effective e	lectuical	
M-FS-937	B67-10091	01	contacts on semiconductor crystal	5	
Combinuous interest shorest a			M-FS-2343	B67-10142	01
Continuous internal channels formed aluminum fusion welds	1 10		GOLD PLATE		
M-FS-2399	B67-10183	05	High-strength braze joints between	copper	
Workmanship standards for fusion we	ldina		and steel M-FS-2519	B67-10211	05
NUC-10050	B67-10200	05			7.0
^			GONIOMETER	magnette	
G			Neutron diffractometer allows both and crystallographic analyses	magnetic	
GALLIUM ARSENIDE	44 - 47		ARG-191	B67-10131	02
Efficient millimeter wave /140 GHz/ for harmonic power generation	aloge		GRAIN		
HQ-61	B67-10166	01	Heans for improving apparent resolu	ation of	

television			HELIUM		
ERC-65	B67-10152	01	Portable detector set discloses heli	ium	
GRAPHITE			leak rates		
Sensing disks for slug-type calorim			M-FS-1733	B67-10065	01
have higher temperature stability			Effects of helium and nitrogen as		
M-FS-1867	B67-10161	01	pressurants in nitrogen tetroxide	transfer	
			MSC-924	B67-10083	03
GRAVITATIONAL EFFECT					
Effect of welding position on poros			Fixture facilitates helium leak tes	ting of	
formation in aluminum alloy welds			pipe welds		
M-FS-2318	B67-10177	05	M-FS-2167	B67-10178	05
u			HIGH STRENGTH STEEL		
Н			Study to minimize hydrogen embrittle	emen t	
HALOGEN COMPOUND			of ultrahigh-strength steels		
Synthesis of various highly halogen	ated		M-FS-2455	B67-10141	03
monomers and polymers					
M-FS-2143	B67-10100	03	HINGE		
HANDBOOK			Adjustable hinge permits movement of in plaster cast	Knee	
Materials data handbooks prepared f	O.F.		M-FS-1756	B67-10056	04
aluminum alloys 2014, 2219, and 5				20, 1000	٠.
stainless steel alloy 301	-		HOLDER		
M-FS-1959	B67-10089	03	Holding fixture facilitates pipe the	read	
HADMONTO OFFICEATOR			gage measurements		
HARMONIC GENERATOR	. diada		M-FS-2009	B67-10066	05
Efficient millimeter wave /140 GHz/ for harmonic power generation	arode		HONEYCOMB		
HQ-61	B67-10166	01	Detection of entrapped moisture in		
	20. 10100		honeycomb sandwich structures		
HARMONICS			MSC-1103	B67-10116	01
Double emitter suppressed carrier m					
uses commercially available compo			HORN ANTENNA		
M-FS-2494	B67-10101	01	Shortened horn-reflector antenna GSFC-502	B67-10017	01
HASTELLOY			G5FC-502	B07-10017	0.1
Composite weld rod corrects individ	lual		HUMIDITY MEASUREMENT		
filler weaknesses			Fluidic oscillator used as humidity	sensor	
M-FS-1923	B67-10107	05	LEWIS-340	B67-10063	05
12-2-2					
Weld procedure produces quality wel thick sections of Hastelloy-X	ds for		HYDRAULIC FLUID		
NUC-10048	B67-10195	05	Test instrumentation evaluates elec hazards in fluid system	trostatic	
### TU040	DO7 10135	00	M-FS-2277	B67-10145	01
HAZARD					
IIIZAND					
Test instrumentation evaluates elec	trostatic		HYDRAULIC SYSTEM		
Test instrumentation evaluates elec hazards in fluid system			High-energy-rate magnetohydraulic m	etal	
Test instrumentation evaluates elec	trostatic B67-10145	01	High-energy-rate magnetohydraulic m forming system		••
Test instrumentation evaluates elec hazards in fluid system M-FS-2277		01	High-energy-rate magnetohydraulic m	et <b>al</b> B67-10126	02
Test instrumentation evaluates electric hazards in fluid system M-FS-2277  HEAT EFFECT	B67-10145	01	High-energy-rate magnetohydraulic m forming system M-FS-2142		02
Test instrumentation evaluates elec hazards in fluid system M-FS-2277	B67-10145	01	High-energy-rate magnetohydraulic m forming system	B67-10126	02
Test instrumentation evaluates electric hazards in fluid system M-FS-2277  HEAT EFFECT Evaluation of high temperature stre	B67-10145	01	High-energy-rate magnetohydraulic m forming system M-FS-2142 HYDRAZINE	B67-10126	02
Test instrumentation evaluates elect hazards in fluid system M-FS-2277  HEAT EFFECT Evaluation of high temperature strandokup wire M-FS-2478	B67-10145		High-energy-rate magnetohydraulic m forming system M-FS-2142 HYDRAZINE Addition of solid oxidizer increase	B67-10126	02
Test instrumentation evaluates electric hazards in fluid system M-FS-2277  HEAT EFFECT Evaluation of high temperature stranshookup wire M-FS-2478  HEAT EXCHANGER	B67-10145 anded B67-10122		High-energy-rate magnetohydraulic m forming system M-FS-2142 HYDRAZINE Addition of solid oxidizer increase fuel specific impulse JPL-861	B67-10126 s liquid	
Test instrumentation evaluates electric hazards in fluid system M-FS-2277  HEAT EFFECT Evaluation of high temperature stronokup wire M-FS-2478  HEAT EXCHANGER Coldplate of pin fin design makes of	B67-10145 anded B67-10122		High-energy-rate magnetohydraulic m forming system M-FS-2142 HYDRAZINE Addition of solid oxidizer increase fuel specific impulse JPL-861 HYDROGEN	B67-10126 s liquid B67-10058	
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NPO-10019	B67-10193	06	NPO-10062	B67-10132	03
IBM 7090 COMPUTER Space trajectories program for IBM NPO-10125	7090 B67-10172	06	IODINE 131  Ion exchange determines iodine-131  concentration in aqueous samples  ARG-208	в67-10129	04
Linear circuit analysis program fo 1620 Monitor II, 1311/1443 data			ION BOMBARDMENT		04
system /CIRCS/ NPO-10131 IBM 7094 COMPUTER	B67-10173	06	Complex surfaces plated by thin-film deposition in one operation LEWIS-292	B67-10006	05
A modal combination computer progr dynamic analysis of structures NPO-10129	am for B67-10217	06	ION EXCHANGE  Ion exchange determines iodine-131  concentration in aqueous samples		
IDENTIFICATION Run numbering system for use with	data		ARG-208	B67-10129	04
recorders M-FS-2557	B67-10215	01	Electron multiplier has improved performance and stability GSFC-546	B67-10060	01
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Porous mandrels provide uniform					
deformation in hydrostatic powder			LOAD FACTOR		
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10 1516	20. 10203	••	MSC-1080	B67-10084	01
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#30-025	DO1-10041	0.5	MSC-1263	B67-10155	01
Portable detector set discloses hel	i u <b>a</b>				
leak rates M-FS-1733	B67-10065	01	M		
n-15-1755	807-10003	01	MAGNESIUM ALLOY		
Portable fixture facilitates pressu			Coating protects magnesium-lithium	alloys	
testing of instrumentation fitting		0.3	against corrosion	B67-10149	03
M-FS-2032	B67-10121	03	M-FS-2446	B07-10149	US
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ARG-96	B67-10134	02	devices KSC-66-13	B67-10031	01
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headers removed by dry blasting w			Variable reluctance switch avoids c	ontact	
abrasive	De2 10140	0.7	corrosion and contact bounce	Deg_10133	
LEWIS-381	B67-10148	03	MSC-1178	B67-10137	01
Fixture facilitates helium leak tes	ting of		Multiplexing control device enables	handling	
pipe welds	•		of wide variations in sampling ra	tes	
M-FS-2167	B67-10178	05	M-FS-1871	B67-10150	01
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1620 Monitor II, 1311/1443 data p	rocessing		and crystallographic analyses ARG-191	B67-10131	02
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WSO-329	B67-10047	05	LEWIS-343	B67-10038	01
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Two techniques enable sampling of fand unfiltered molten metals	TITELEC		of maser		
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M-FS-1852	B67-10064	05	formation in aluminum alloy weld:	5	
			M-FS-2318	B67-10177	05

POROUS MATERIAL Composites of porous metal and solid lubricants increase bearing life			exhibits linear transfer function HQ-56	B67-10055	01
LEWIS-307	B67-10007	03	PUNP		
POSITIONING EQUIPMENT Adjustable, self-locking ladder incl	udes		Simple pump maintains liquid helium cryostat M-FS-1763	B67-10039	05
optional work platform M-FS-1922	B67-10067	0.5		_	
n-r3-1922	867-10067	05	Visco seal design offers zero-leaka wear-free characteristics	ge and	
POTASSIUM NITRATE Hydrated multivalent cations are new	class		WSO-329	B67-10047	05
of molten salt mixtures			Negative feedback system reduces pu	<b>e</b> p	
ARG-211 POTENTIOMETER	B67-10033	03	oscillations M-FS-1852	B67-10064	05
Double emitter suppressed carrier mo	dulator		PURIFICATION		
uses commercially available compon			Purification train produces ultrapu	re	
M-FS-2494	B67-10101	01	hydrogen gas		
			M-FS-1913	B67-10078	03
POWDER METALLURGY			_		
Porous mandrels provide uniform deformation in hydrostatic powder			Q		
metallurgy in nydrostatic powder			Q-FACTOR		
M-FS-1972	B67-10209	03	RF inductor has high Q, is stable a	t	
			higher temperatures	•	
POWER DENSITY			JPL-1019 .	B67-10106	01
A power-spectral-density computer pr					
NPO-10126	B67-10160	01	QUALITY CONTROL		
PRESSURE			Monitor assures availability and qu communication channels	ality of	
Miniature capacitor functions as pre	ggura		KSC-66-38	B67-10028	01
sensor			KDC 00 00	DO7-10020	01
JPL-903	B67-10020	01	QUANTITATIVE ANALYSIS		
			Crystal microbalance measures conde	nsable	
PRESSURE EFFECT	-		molecular fluxes		
Fixture tests bellows reliability the repetitive pressure/temperature caperature			JPL-845	B67-10012	03
MSC-1176	B67-10111	01	Separation technique provides rapid		
			quantitative determination of ces		
PRESSURE REGULATOR			in irradiated nuclear fuel		
High speed blowdown system provides	rapid		NUC-10047	B67-10194	03
pressure loss LEWIS-375	B67-10043	05	QUARTZ		
		นอ			
				nashla	
			Crystal microbalance measures conde	nsable	
Portable fixture facilitates pressur testing of instrumentation fitting	re			B67-10012	03
Portable fixture facilitates pressu	re	03	Crystal microbalance measures conde molecular fluxes JPL-845	B67-10012	03
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032	la Le	03	Crystal microbalance measures conde molecular fluxes JPL-845 Quartz crystals detect gas contamin	B67-10012	03
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032 PRESSURE TRANSDUCER	re gs B67-10121	03	Crystal microbalance measures conde molecular fluxes JPL-845 Quartz crystals detect gas contamin during vacuum chamber evacuation	B67-10012	
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032 PRESSURE TRANSDUCER System enables more complete calibra	re gs B67-10121	03	Crystal microbalance measures conde molecular fluxes JPL-845 Quartz crystals detect gas contamin	B67-10012	03
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032 PRESSURE TRANSDUCER	re gs B67-10121	03	Crystal microbalance measures conde molecular fluxes JPL-845 Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144	B67-10012	
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibra of dynamic-pressure transducers M-FS-2063	re js B67-10121 ations		Crystal microbalance measures condemolecular fluxes JPL-845  Quartz crystals detect gas contaminduring vacuum chamber evacuation NPO-10144	B67-10012	
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibra of dynamic-pressure transducers M-FS-2063  PRESSURIZATION	ne gs B67-10121 ations B67-10099		Crystal microbalance measures condemolecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R RADIAL DISTRIBUTION	B67-10012 eants B67-10205	
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibra of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroids	ne	01	Crystal microbalance measures conde molecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R  RADIAL DISTRIBUTION Radial furnace shows promise for gr	B67-10012 eants B67-10205	
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibra of dynamic-pressure transducers M-FS-2063  PRESSURIZATION	ne gs B67-10121 ations B67-10099		Crystal microbalance measures conde molecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R  RADIAL DISTRIBUTION  Radial furnace shows promise for gr straight boron carbide whiskers	B67-10012 aants B67-10205	01
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibra of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroids	ne	01	Crystal microbalance measures conde molecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R  RADIAL DISTRIBUTION Radial furnace shows promise for gr	B67-10012 eants B67-10205	
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibrate of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroide HQ-27  PRISM Special purpose reflectometer uses in	ne gs B67-10121 ations B67-10099 al shells B67-10117	01	Crystal microbalance measures conde molecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R  RADIAL DISTRIBUTION Radial furnace shows promise for gr straight boron carbide whiskers HQ-50  RADIATION	B67-10012 B67-10205 Cowing B67-10070	01
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibrate of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroide HQ-27  PRISM Special purpose reflectometer uses a Ulbricht sphere	ne js B67-10121 ations B67-10099 al shells B67-10117	01 05	Crystal microbalance measures conde molecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R  RADIAL DISTRIBUTION  Radial furnace shows promise for gr straight boron carbide whiskers HQ-50  RADIATION  Process sequence produces strong, 1	B67-10012 B67-10205 Cowing B67-10070	01
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibrate of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroide HQ-27  PRISM Special purpose reflectometer uses in	ne gs B67-10121 ations B67-10099 al shells B67-10117	01	Crystal microbalance measures conde molecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R  RADIAL DISTRIBUTION Radial furnace shows promise for gr straight boron carbide whiskers HQ-50  RADIATION Process sequence produces strong, 1 reflectors of excellent quality	B67-10012  ents  B67-10205  cowing  B67-10070  ightweight	01
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibrate of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroide HQ-27  PRISM Special purpose reflectometer uses a Ulbricht sphere MSC-1135	ne js B67-10121 ations B67-10099 al shells B67-10117	01 05	Crystal microbalance measures conde molecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R  RADIAL DISTRIBUTION  Radial furnace shows promise for gr straight boron carbide whiskers HQ-50  RADIATION  Process sequence produces strong, 1	B67-10012 B67-10205 Cowing B67-10070	01
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibre of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroids HQ-27  PRISM Special purpose reflectometer uses of Ulbricht sphere MSC-1135  PROBABILITY	ne js B67-10121 ations B67-10099 al shells B67-10117	01 05	Crystal microbalance measures conde molecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R  RADIAL DISTRIBUTION Radial furnace shows promise for gr straight boron carbide whiskers HQ-50  RADIATION Process sequence produces strong, 1 reflectors of excellent quality	B67-10012  ents  B67-10205  cowing  B67-10070  ightweight	01
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibro of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroids HQ-27  PRISM Special purpose reflectometer uses a Ulbricht sphere MSC-1135  PROBABILITY FM carrier deviation measured by differential probability method	me  gs  B67-10121  ations  B67-10099  al shells  B67-10117  modified  B67-10109	01 05	Crystal microbalance measures condemolecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R RADIAL DISTRIBUTION Radial furnace shows promise for gr straight boron carbide whiskers HQ-50  RADIATION Process sequence produces strong, 1 reflectors of excellent quality LEWIS-331  RADIATION COUNTER Aluminized thin-window proportional	B67-10012  ents  B67-10205  owing  B67-10070  ightweight  B67-10010	01
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibrate of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroids HQ-27  PRISM Special purpose reflectometer uses to Ulbricht sphere MSC-1135  PROBABILITY FM carrier deviation measured by	ne js B67-10121 ations B67-10099 al shells B67-10117	01 05	Crystal microbalance measures conde molecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R  RADIAL DISTRIBUTION Radial furnace shows promise for gr straight boron carbide whiskers HQ-50  RADIATION Process sequence produces strong, l reflectors of excellent quality LEWIS-331  RADIATION COUNTER Aluminized thin-window proportional tube is stronger, more responsive	B67-10012  ents  B67-10205  owing  B67-10070  ightweight  B67-10010	01
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibrates of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroids HQ-27  PRISM Special purpose reflectometer uses of Ulbricht sphere MSC-1135  PROBABILITY FM carrier deviation measured by differential probability method M-FS-2166	me  gs  B67-10121  ations  B67-10099  al shells  B67-10117  modified  B67-10109	01 05	Crystal microbalance measures conde molecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R RADIAL DISTRIBUTION Radial furnace shows promise for gr straight boron carbide whiskers HQ-50  RADIATION Process sequence produces strong, l reflectors of excellent quality LEWIS-331  RADIATION COUNTER Aluminized thin-window proportional tube is stronger, more responsive wavelength region	B67-10012 ents B67-10205  owing B67-10070  lightweight B67-10010  -counter in long	01 03
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibra of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroids HQ-27  PRISM Special purpose reflectometer uses a Ulbricht sphere MSC-1135  PROBABILITY FM carrier deviation measured by differential probability method M-FS-2166  PROGRAM MANAGEMENT	me  gs  B67-10121  ations  B67-10099  al shells  B67-10117  modified  B67-10109	01 05	Crystal microbalance measures conde molecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R  RADIAL DISTRIBUTION Radial furnace shows promise for gr straight boron carbide whiskers HQ-50  RADIATION Process sequence produces strong, l reflectors of excellent quality LEWIS-331  RADIATION COUNTER Aluminized thin-window proportional tube is stronger, more responsive	B67-10012  ents  B67-10205  owing  B67-10070  ightweight  B67-10010	01
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibrates of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroids HQ-27  PRISM Special purpose reflectometer uses of Ulbricht sphere MSC-1135  PROBABILITY FM carrier deviation measured by differential probability method M-FS-2166	me  gs  B67-10121  ations  B67-10099  al shells  B67-10117  modified  B67-10109	01 05	Crystal microbalance measures conde molecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R RADIAL DISTRIBUTION Radial furnace shows promise for gr straight boron carbide whiskers HQ-50  RADIATION Process sequence produces strong, l reflectors of excellent quality LEWIS-331  RADIATION COUNTER Aluminized thin-window proportional tube is stronger, more responsive wavelength region	B67-10012 ents B67-10205  owing B67-10070  lightweight B67-10010  -counter in long	01 03
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibra of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroids HQ-27  PRISM Special purpose reflectometer uses a Ulbricht sphere MSC-1135  PROBABILITY FM carrier deviation measured by differential probability method M-FS-2166  PROGRAM MANAGEMENT GREMEX-A new management training con GSFC-574	me  gs  B67-10121  ations  B67-10099  al shells  B67-10117  modified  B67-10109  B67-10213	01 05 02	Crystal microbalance measures condemolecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  RADIAL DISTRIBUTION Radial furnace shows promise for gr straight boron carbide whiskers HQ-50  RADIATION Process sequence produces strong, l reflectors of excellent quality LEWIS-331  RADIATION COUNTER Aluminized thin-window proportional tube is stronger, more responsive wavelength region JPL-689	B67-10012 ents B67-10205  owing B67-10070  lightweight B67-10010 counter in long B67-10015	01 03
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibrates of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroide HQ-27  PRISM Special purpose reflectometer uses a Ulbricht sphere MSC-1135  PROBABILITY FM carrier deviation measured by differential probability method M-FS-2166  PROGRAM MANAGEMENT GREMEX-A new management training con GSFC-574  PROPORTIONAL CONTROL	B67-10121  ations  B67-10099  al shells  B67-10117  modified  B67-10109  B67-10213	01 05 02	Crystal microbalance measures conde molecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R  RADIAL DISTRIBUTION Radial furnace shows promise for gr straight boron carbide whiskers HQ-50  RADIATION Process sequence produces strong, 1 reflectors of excellent quality LEWIS-331  RADIATION COUNTER Aluminized thin-window proportional tube is stronger, more responsive wavelength region JPL-689  RADIATION RESISTANCE Simplified method introduces drift into cells	B67-10012 ents B67-10205  cowing B67-10070  ightweight B67-10010  -counter in long B67-10015  fields	01 03 05
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibrates of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroide HQ-27  PRISM Special purpose reflectometer uses a Ulbricht sphere MSC-1135  PROBABILITY FM carrier deviation measured by differential probability method M-FS-2166  PROGRAM MANAGEMENT GREMEX-A new management training con GSFC-574  PROPORTIONAL CONTROL Heater control circuit provides both	B67-10121  ations  B67-10099  al shells  B67-10117  modified  B67-10109  B67-10213	01 05 02	Crystal microbalance measures condemolecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R RADIAL DISTRIBUTION Radial furnace shows promise for gr straight boron carbide whiskers HQ-50  RADIATION Process sequence produces strong, 1 reflectors of excellent quality LEWIS-331  RADIATION COUNTER Aluminized thin-window proportional tube is stronger, more responsive wavelength region JPL-689  RADIATION RESISTANCE Simplified method introduces drift	B67-10012 ents B67-10205  owing B67-10070  lightweight B67-10010 counter in long B67-10015	01 03
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibro of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroids HQ-27  PRISM Special purpose reflectometer uses a Ulbricht sphere MSC-1135  PROBABILITY FM carrier deviation measured by differential probability method M-FS-2166  PROGRAM MANAGEMENT GREMEX-A new management training compositions of the control circuit provides both and proportional control	me  gs  B67-10121  ations  B67-10099  al shells  B67-10117  modified  B67-10109  B67-10092  ancept  B67-10092	01 05 02 01	Crystal microbalance measures condemolecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R  RADIAL DISTRIBUTION Radial furnace shows promise for gr straight boron carbide whiskers HQ-50  RADIATION Process sequence produces strong, l reflectors of excellent quality LEWIS-331  RADIATION COUNTER Aluminized thin-window proportional tube is stronger, more responsive wavelength region JPL-689  RADIATION RESISTANCE Simplified method introduces drift into cells GSFC-572	B67-10012 ents B67-10205  cowing B67-10070  ightweight B67-10010  -counter in long B67-10015  fields	01 03 05
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibrates of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroide HQ-27  PRISM Special purpose reflectometer uses a Ulbricht sphere MSC-1135  PROBABILITY FM carrier deviation measured by differential probability method M-FS-2166  PROGRAM MANAGEMENT GREMEX-A new management training con GSFC-574  PROPORTIONAL CONTROL Heater control circuit provides both and proportional control M-FS-906	B67-10121  ations  B67-10099  al shells  B67-10117  modified  B67-10109  B67-10213	01 05 02	Crystal microbalance measures condemolecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R RADIAL DISTRIBUTION Radial furnace shows promise for gr straight boron carbide whiskers HQ-50  RADIATION Process sequence produces strong, 1 reflectors of excellent quality LEWIS-331  RADIATION COUNTER Aluminized thin-window proportional tube is stronger, more responsive wavelength region JPL-689  RADIATION RESISTANCE Simplified method introduces drift into cells GSFC-572  RADIATION SHIELDING	B67-10012 ents B67-10205  cowing B67-10070  ightweight B67-10010  -counter in long B67-10015  fields	01 03 05
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibra of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroids HQ-27  PRISM Special purpose reflectometer uses a Ulbricht sphere MSC-1135  PROBABILITY FM carrier deviation measured by differential probability method M-FS-2166  PROGRAM MANAGEMENT GREMEX-A new management training col GSFC-574  PROPORTIONAL CONTROL Heater control circuit provides both and proportional control M-FS-906  PROTECTIVE COATING	me gs B67-10121 ations B67-10099 al shells B67-10117 modified B67-10109 B67-10213 mcept B67-10092 at fast B67-10097	01 05 02 01	Crystal microbalance measures condemolecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R  RADIAL DISTRIBUTION Radial furnace shows promise for gr straight boron carbide whiskers HQ-50  RADIATION Process sequence produces strong, l reflectors of excellent quality LEWIS-331  RADIATION COUNTER Aluminized thin-window proportional tube is stronger, more responsive wavelength region JPL-689  RADIATION RESISTANCE Simplified method introduces drift into cells GSFC-572	B67-10012  ents  B67-10205  cowing  B67-10070  ightweight  B67-10010  -counter in long  B67-10015  fields  B67-10102	01 03 05
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibrates of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroide HQ-27  PRISM Special purpose reflectometer uses a Ulbricht sphere MSC-1135  PROBABILITY FM carrier deviation measured by differential probability method M-FS-2166  PROGRAM MANAGEMENT GREMEX-A new management training con GSFC-574  PROPORTIONAL CONTROL Heater control circuit provides both and proportional control M-FS-906  PROTECTIVE COATING Coating protects magnesium-lithium in	me gs B67-10121 ations B67-10099 al shells B67-10117 modified B67-10109 B67-10213 mcept B67-10092 at fast B67-10097	01 05 02 01	Crystal microbalance measures condemolecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R RADIAL DISTRIBUTION Radial furnace shows promise for gr straight boron carbide whiskers HQ-50  RADIATION Process sequence produces strong, l reflectors of excellent quality LEWIS-331  RADIATION COUNTER Aluminized thin-window proportional tube is stronger, more responsive wavelength region JPL-689  RADIATION RESISTANCE Simplified method introduces drift into cells GSFC-572  RADIATION SHIELDING Mechanisms of superconductivity	B67-10012  ents  B67-10205  cowing  B67-10070  lightweight  B67-10010  counter in long  B67-10015  fields  B67-10102	01 03 05
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibre of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroids HQ-27  PRISM Special purpose reflectometer uses of Ulbricht sphere MSC-1135  PROBABILITY FM carrier deviation measured by differential probability method M-FS-2166  PROGRAM MANAGEMENT GREMEX-A new management training col GSFC-574  PROPORTIONAL CONTROL Heater control circuit provides both and proportional control M-FS-906  PROTECTIVE COATING Coating protects magnesium-lithium against corrosion	B67-10121  ations  B67-10099  al shells  B67-10117  modified  B67-10109  B67-10092  at fast  B67-10097  alloys	01 05 02 01 01	Crystal microbalance measures condemolecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R  RADIAL DISTRIBUTION Radial furnace shows promise for gr straight boron carbide whiskers HQ-50  RADIATION Process sequence produces strong, l reflectors of excellent quality LEWIS-331  RADIATION COUNTER Aluminized thin-window proportional tube is stronger, more responsive wavelength region JPL-689  RADIATION RESISTANCE Simplified method introduces drift into cells GSFC-572  RADIATION SHIELDING Mechanisms of superconductivity investigated by nuclear radiation M-FS-1944	B67-10012  ents  B67-10205  cowing  B67-10070  ightweight  B67-10010  -counter in long  B67-10015  fields  B67-10102	01 03 05
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibrates of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroide HQ-27  PRISM Special purpose reflectometer uses a Ulbricht sphere MSC-1135  PROBABILITY FM carrier deviation measured by differential probability method M-FS-2166  PROGRAM MANAGEMENT GREMEX-A new management training con GSFC-574  PROPORTIONAL CONTROL Heater control circuit provides both and proportional control M-FS-906  PROTECTIVE COATING Coating protects magnesium-lithium in	me gs B67-10121 ations B67-10099 al shells B67-10117 modified B67-10109 B67-10213 mcept B67-10092 at fast B67-10097	01 05 02 01	Crystal microbalance measures condemolecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R  RADIAL DISTRIBUTION Radial furnace shows promise for gr straight boron carbide whiskers HQ-50  RADIATION Process sequence produces strong, l reflectors of excellent quality LEWIS-331  RADIATION COUNTER Aluminized thin-window proportional tube is stronger, more responsive wavelength region JPL-689  RADIATION RESISTANCE Simplified method introduces drift into cells GSFC-572  RADIATION SHIELDING Mechanisms of superconductivity investigated by nuclear radiation M-FS-1944  RADIO FREQUENCY	B67-10012  ents  B67-10205  cowing  B67-10070  lightweight  B67-10010 counter in long  B67-10015  fields  B67-10102	01 03 05
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibre of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroids HQ-27  PRISM Special purpose reflectometer uses of Ulbricht sphere MSC-1135  PROBABILITY FM carrier deviation measured by differential probability method M-FS-2166  PROGRAM MANAGEMENT GREMEX-A new management training col GSFC-574  PROPORTIONAL CONTROL Heater control circuit provides both and proportional control M-FS-906  PROTECTIVE COATING Coating protects magnesium-lithium against corrosion	B67-10121  ations  B67-10099  al shells  B67-10117  modified  B67-10109  B67-10092  at fast  B67-10097  alloys	01 05 02 01 01	Crystal microbalance measures condemolecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R  RADIAL DISTRIBUTION Radial furnace shows promise for gr straight boron carbide whiskers HQ-50  RADIATION Process sequence produces strong, l reflectors of excellent quality LEWIS-331  RADIATION COUNTER Aluminized thin-window proportional tube is stronger, more responsive wavelength region JPL-689  RADIATION RESISTANCE Simplified method introduces drift into cells GSFC-572  RADIATION SHIELDING Mechanisms of superconductivity investigated by nuclear radiation M-FS-1944	B67-10012  ents  B67-10205  cowing  B67-10070  lightweight  B67-10010 counter in long  B67-10015  fields  B67-10102	01 03 05
Portable fixture facilitates pressur testing of instrumentation fitting M-FS-2032  PRESSURE TRANSDUCER System enables more complete calibrates of dynamic-pressure transducers M-FS-2063  PRESSURIZATION Investigation of pressurized toroids HQ-27  PRISM Special purpose reflectometer uses a Ulbricht sphere MSC-1135  PROBABILITY FM carrier deviation measured by differential probability method M-FS-2166  PROGRAM MANAGEMENT GREMEX-A new management training con GSFC-574  PROPORTIONAL CONTROL Heater control circuit provides both and proportional control M-FS-906  PROTECTIVE COATING Coating protects magnesium-lithium a against corrosion M-FS-2446  PULSE AMPLITUDE	B67-10121  ations  B67-10099  al shells  B67-10117  addified  B67-10109  B67-10092  at fast  B67-10097  alloys  B67-10149	01 05 02 01 01	Crystal microbalance measures condemolecular fluxes JPL-845  Quartz crystals detect gas contamin during vacuum chamber evacuation NPO-10144  R  RADIAL DISTRIBUTION Radial furnace shows promise for gr straight boron carbide whiskers HQ-50  RADIATION Process sequence produces strong, 1 reflectors of excellent quality LEWIS-331  RADIATION COUNTER Aluminized thin-window proportional tube is stronger, more responsive wavelength region JPL-689  RADIATION RESISTANCE Simplified method introduces drift into cells GSFC-572  RADIATION SHIELDING Mechanisms of superconductivity investigated by nuclear radiation M-FS-1944  RADIO FREQUENCY Feed-through connector couples RF p	B67-10012  ents  B67-10205  cowing  B67-10070  lightweight  B67-10010 counter in long  B67-10015  fields  B67-10102	01 03 05
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RADIOACTIVE ISOTOPE  Ion exchange determines iodine-131  concentration in aqueous samples	7 10100 01	RELIEF VALVE Improved cryogenic refrigeration syst JPL-731 B	em 67-10128 02
ARG-208 B6 RADIOACTIVE PARTICLE	67-10129 04	Aspirator increases relief valve popp	et
Apparatus for fabrication of americium beryllium neutron sources prevents o		•	667-10154 05
contamination ARG-184 B6	67-10202 05	RELUCTIVITY  Variable reluctance switch avoids con corrosion and contact bounce	itact
RANDOM NOISE A power-spectral-density computer programmer and programmer and programmer and programmer programmer programmer.		MSC-1178	67-10137 01
NPO-10126 B6	57-10160 01	REPAIR Abraded cadmium-plated cable connectorepaired by conversion coating	
A power-spectral-density computer prog NPO-10126 B6	ram 57-10160 01	M-FS-1424 B RESIDUAL STRESS	367-10014 03
REACTOR Study made of corrosion resistance of stainless steel and nickel alloys in	nuclear	Glass bead shot peening retards stres corrosion failure of titanium tanks	
reactor superheaters ARG-230 B6	67-10051 03	RESISTANCE HEATING Resistance heating releases structure	al .
REACTOR FUEL Fluid-bed fluoride volatility process recovers uranium from spent uranium	*llov	adhesive M-FS-1607 E	367-10045 05
fuels	37-10032 03	RESISTANCE THERMOMETER Flow-test device fits into restricted access passages	i
RECORDING INSTRUMENT Technique for strip chart recorder tis	1e		867-10074 01
	57-10196 01	RESOLUTION  Means for improving apparent resoluti  television	
REDUNDANT SYSTEM Triple Modular Redundancy /TMR/ comput operation improved	ter	ERC-65 E	867-10152 01
MSC-831 B6	57-10085 01	Environmental study of miniature slip	p rings 867-10210 05
Automatic channel switching device MSC-832 B6	57-10086 01	S	
REFLECTED RAY		SAFETY	
Fatigue zones in metals identified by polarized light photography		Apparatus for fabrication of americit beryllium neutron sources prevents	
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Viculation theorem is remotely sealed by  Workship of earlier action  Windows prevents littering of alliver plating at elevated temperatures  RF-2-2049  Cryogenic seal receilins leakinght during thereal displacement  Workship of alliver  The plating at elevated temperatures  RF-2-2048  SELDY-EXEMPTOR  Cryogenic seal receilins leakinght during thereal displacement  Workship of all the plate of	wear-free characteristics	D.C. 1004.		MSC-407	B67-10110	02
Vacuus chamber is resolvely sealed by search   B67-10150   B67-10151   B67-1	WS0-329	B67-10047	05	SHIFT REGISTER		
Mon-cost prevents bilistering of silver plating at elevant temperatures   B67-10056   SEP-10056   SE		y		Electronic frequency discriminator		
Undercoat prevents blistering of sliver plating at elevated temperatures and results of the plating at elevated temperatures and results and setting during and results and setting during and results and setting during and results and setting and		B67-10059	05	M-FS-2434	B67-10151	01
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Cryogenic seal remains leaktight during thereal displacement ARO-96 87-10134 02		lver		Glass bead shot peening retards str	ess ka	
SELECK FFFECT Thermoelactric metal comparator determines composition of alloys and wetals 867-1035 01  SELECT HUBRICATING HATERIAL Composition of alloys and wetals 867-1035 01  SELECT HUBRICATING HATERIAL Composition of alloys and wetals 867-1035 01  SELECT HUBRICATING HATERIAL Composition of alloys and wetals 867-1035 01  SELECT HUBRICATING HATERIAL Composition of alloys and wetals 867-1035 01  SELECT HUBRICATING HATERIAL Composition of alloys and wetals 867-1035 03  SELECT HUBRICATING HATERIAL Composition of alloys and wetals 867-1035 03  SELECT HUBRICATING HATERIAL Voltage regulator/amplifier is self—regulated MSC-1240  SELECT HUBRICATION Voltage regulator/amplifier is self—regulated		B67-10096	05			05
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SELFLURINCATING MATERIAL   Composites of porous setal and sold   LPUIS-307   Sector Secto		ermines				
Composites of porous setal and solid labricants increase bearing life in labricants increase bearing life is self-negulated MSC-1200   SELF-OSCILLATION		B67-10035	01		B67-10118	01
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SEF-OSCILIATION   SEF-1007   SE	Composites of porous metal and solid	d .		Personal communication system combi	nes high	
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guidance system	Star/horizon simulator used to test guidance system	space		MSC-228	B67-10164	02

SOLENOID			ARG-119	B67-10036	02
Variable-pulse switching circuit acc controls solenoid-valve actuations M-FS-1895		01	SPECTROSCOPY Study made of far infrared spectra of	of	
Residual magnetism holds solenoid an	rmature		silicate minerals M-FS-1811	B67-10075	02
in desired position LEWIS-343	B67-10038	01	SPEED REGULATION Design concept to decrease relative	speed	
Simple pump maintains liquid helium cryostat	level in		of ball bearings M-FS-2003	B67-10212	05
M-FS-1763	B67-10039	05	SPHERE		
SOLID LUBRICANT Composites of porous metal and solid	i		Special purpose reflectometer uses in Ulbricht sphere		••
lubricants increase bearing life LEWIS-307	B67-10007	03	MSC-1135 SPRING	B67-10109	02
SOLID STATE DEVICE Hybrid solid state switch replaces a	otor-		Elastic guides reduce hysteresis ef: Belleville spring package	fect in	
driven power switch JPL-931	B67-10165	01	JPL-910	B67-10011	05
SOLUBILITY			SPUTTERING Complex surfaces plated by thin-file	•	
Solubility data are compiled for met liquid zinc ARG-149	tals in B67-10191	0.7	deposition in one operation LEWIS-292	B67-10006	05
SOUND FIELD	867-10191	03	STAINLESS STEEL Study made of corrosion resistance	n <b>f</b>	
Study made of interaction between so fields and structural vibrations HQ-26		• •	stainless steel and nickel alloys reactor superheaters		03
SPACE ORIENTATION	B67-10068	02	ARG-230  Materials data handbooks prepared for		vo
Visual attitude orientation and alig	jnmen t		aluminum alloys 2014, 2219, and 5 stainless steel alloy 301	456, and	
MSC-647	B67-10120	02	M-FS-1959	B67-10089	03
SPACE PROBE Space trajectories program for IBM : NPO-10125	7090 B67-10172	06	Ultrasonics permits brazing complex steel assembly without flux NU-0115	stainless B67-10094	05
SPACE STATION			STEEL		
Study of dynamic response of elastic stations NPO-10124	B67-10169	06	Controlled ferrite content improves weldability of corrosion-resistan M-FS-568		03
SPACE SUIT	JO: 10103	••	Effects of heat input rates on T-1	_	••
Integrated mobility measurement and system	notation		T-1A steel welds M-FS-2475	B67-10163	03
MSC-726	B67-10114	04	High-strength braze joints between	copper	
SPACE TRAJECTORY PROGRAM  Space trajectories program for IBM		0.0	and steel M-FS-2519	B67-10211	05
NPO-10125  SPACECRAFT COMMUNICATIONS SYSTEM	B67-10172	06	STELLAR REFRACTION	****	
Personal communication system combined performance with miniaturization	nes high		Star/horizon simulator used to test guidance system MSC-407	B67-10110	02
MSC-720	B67-10119	01	STIRLING CYCLE	200	
SPACECRAFT CONTROL  A modal combination computer program dynamic analysis of structures	• for		Improved cryogenic refrigeration sy JPL-731	stem B67-10128	02
NPO-10129	B67-10217	06	STRAIN GAUGE Strain gage circuitry provides fati	gue	
SPACECRAFT ELECTRONIC EQUIPMENT Evaluation of high temperature strategy hookup wire	nded		testing machine with accurate cyc NU-0114	le count B67-10093	01
M-FS-2478	B67-10122	03	Stress calculator speedily converts data	strain	
SPACECRAFT GUIDANCE Star/horizon simulator used to test	space		M-FS-2021	B67-10182	03
guidance system MSC-407	B67-10110	02	STRESS CALCULATION Stress calculator speedily converts	strain	
SPARK DISCHARGE Toroidal ring prevents gas ignition	at		data M-FS-2021	B67-10182	03
vent stack outlet M-FS-2042	B67-10098	05	STRESS CORROSION  Degressing of titenium to minimize	stress	
SPECIFIC IMPULSE Addition of solid oxidizer increase	• Naula		corrosion Lewis-382	B67-10147	03
fuel specific impulse JPL-861	B67-10058	03	Glass bead shot peening retards at corrosion failure of titanium ter LANGLEY-319	ress nks B67-10198	0:
SPECTROGRAPHY Neutron activation analysis traces artifacts to geographical point o	copper f origin		STRUCTURAL DYNAMICS A model combination computer progra		

dynamic analysis of structures NPO-10129	B67-10217	06	constituents and oxides NU-0095	B67-10062	03
STRUCTURAL FAILURE			Solubility data are compiled for med	tals in	
Study to minimize hydrogen embrittl of ultrahigh-strength steels M-FS-2455	ement B67-10141	03	liquid zinc ARG-149	B67-10191	03
CTDUCTURAL METROLOGICA		••	TANTALUM		
STRUCTURAL VIBRATION Study made of interaction between s	ound		Thin film process forms effective el contacts on semiconductor crystals		
fields and structural vibrations			M-FS-2343	B67-10142	01
HQ-26	B67-10068	02	TAPE RECORDER		
SUBSTRATE			Recording and time expansion technic		
Oxide film on metal substrate reduc form metal-oxide-metal layer stru			high-speed, single-shot transient signal	video	
ARG-48	B67-10187	03	ARC-10003	B67-10139	01
SUPERCONDUCTING MAGNET			TEFLON		
Mechanisms of superconductivity investigated by nuclear radiation			Technique for stripping Teflon insul	lated	
M-FS-1944	B67-10057	02	M-FS-1774	B67-10048	05
SUPERHEATING			Evaluation of high temperature stra	nded	
Zirconium alloys with small amounts			hookup wire		
and copper or nickel show improve resistance in superheated steam	d corresion		M-FS-2478	B67-10122	03
ARG-226	B67-10050	03	TELECOMMUNICATION		
Study made of corrosion resistance			Multiplexing control device enables of wide variations in sampling rate	handling tes	
stainless steel and nickel alloys reactor superheaters	in nuclear		M-FS-1871	B67-10150	01
ARG-230	B67-10051	03	TELEMETRY		
SUPPRESSOR			Multiplexing control device enables of wide variations in sampling ra-		
High transients suppressed in elect devices	romagnetic		M-FS-1871	B67-10150	01
KSC-66-13	B67-10031	01	A conceptual, parallel operating da	ta	
SURFACE TREATMENT			compression processor NPO-10068	B67-10204	01
Composites of porous metal and soli	ď.				•-
lubricants increase bearing life LEWIS-307	B67-10007	03	TELEVISION  Means for improving apparent resolutions	tion of	
Study made of corrosion resistance	of		television ERC-65	B67-10152	01
stainless steel and nickel alloys				BO7-10102	V.
reactor superheaters ARG-230	B67-10051	03	TELEVISION CAMERA Subminiature deflection circuit oper	rates	
SWITCH			integrated sweep circuits in TV co		01
Variable reluctance switch avoids of	ontact			B07-10133	01
corrosion and contact bounce MSC-1178	B67-10137	01	TELEVISION TRANSMISSION TV synchronization system features		
SWITCHING CIRCUIT			stability and noise immunity JPL-915	B67-10118	01
Computer program detects transient				B07-10116	01
malfunctions in switching circuit MSC-604	B67-10002	01	TEMPERATURE CONTROL  Heater control circuit provides both	h fast	
			and proportional control		
Variable-pulse switching circuit ac controls solenoid-valve actuation	curately 13		M-FS-906	B67-10097	01
M-FS-1895	B67-10022	01	TENSILE STRESS Glass bead shot peening retards str	69 <b>9</b>	
Switching-type regulator circuit ha	ıs		corrosion failure of titanium tan	ks	
increased efficiency MSC-1063	B67-10190	01	LANGLEY-319	B67-10198	05
SWITCHING FUNCTION			TEST CHAMBER High speed blowdown system provides	ranid	
Automatic channel switching device			pressure loss	-	
MSC-832	B67-10086	01	LEWIS-375	B67-10043	05
Scanning means for Cassegrainian an JPL-946		05	TEST EQUIPMENT	h!	
	B67-10174	05	Tester for study of rolling element LEWIS-305	B67-10009	01
SYNCHRONOUS MOTOR Circuit increases capability of hys	iteresis		Flow-test device fits into restrict	ed	
synchronous motor			access passages		
MSC-1080	B67-10084	01	MSC-1078	B67-10074	01
SYSTEMS DESIGN  Program computes single-point failt	ires in		Special purpose reflectometer uses a Ulbricht sphere	modified	
critical system designs			MSC-1135	B67-10109	02
MSC-603	B67-10001	01	Fixture tests bellows reliability t	hrough	
Ţ			repetitive pressure/temperature c MSC-1176		61
TABLE					01
Recommended values of the thermophy			Portable fixture facilitates pressu testing of instrumentation fittin		

M-FS-2032	B67-10121	03	M-FS-2039	B67-10105	05
TETROXIDE			Single wrench separates nuts from fr	ee-	
Effects of helium and nitrogen as			floating bolts		ΛE
pressurants in nitrogen tetroxide MSC-924	transfer B67-10083	03	NUC-10013	B67-10158	05
			TOROIDAL SHELL		
THERAPY Uranyl phthalocyanines show promise	in the		Investigation of pressurized toroida HQ-27	B67-10117	05
treatment of brain tumors			·		
ARG-100	B67-10188	04	TRACER Portable detector set discloses heli	um	
THERMAL CYCLING	_		leak rates		
Thermal and bias cycling stabilizes silicon devices	planar		M-FS-1733	B67-10065	01
ERC-48	B67-10176	01	Fixture facilitates helium leak test	ing of	
THERMAL INSULATION			pipe welds M-FS-2167	B67-10178	05
Dispersion of borax in plastic is e	xcellent				
fire-retardant heat insulator ARG-5	B67-10016	03	TRAINING GREMEX-A new management training con	cept	
	20, 10010	••	GSFC-574	B67-10092	01
THERMAL NEUTRON  Detection of entrapped moisture in			TRANSDUCER		
honeycomb sandwich structures			Multipurpose instrumentation cable p	rovides	
MSC-1103	B67-10116	01	integral thermocouple circuit NU-0108	B67-10046	01
THERMOCOUPLE					
Multipurpose instrumentation cable integral thermocouple circuit	provides		Ultrasonics permits brazing complex steel assembly without flux	stainless	
NU-0108	B67-10046	01	NU-0115	B67-10094	05
Sensing disks for slug-type calorim	-+		TRANSFER FUNCTION		
have higher temperature stability			Circuit multiplies pulse width modul	lation,	
M-FS-1867	B67-10161	01	exhibits linear transfer function	B67-10055	01
THERMODYNAMIC PROPERTY			HQ-56	B07-10033	01
Thermodynamic properties related to			TRANSIENT RESPONSE		
expansion of two-component gas MSC-1133	B67-10112	03	Polarimeter provides transient responsion nanosecond range	)n se	
SUSPENSE IVATAS			JPL-890	B67-10021	92
THERMOPHYSICS Recommended values of the thermophy	sical		TRANSISTOR CIRCUIT		
properties of eight alloys, their			Double emitter suppressed carrier me		
constituents and oxides NU-0095	B67-10062	03	uses commercially available compo- M-FS-2494	B67-10101	01
#UCDMOG PRE THE			71 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
THERMOSETTING New class of thermosetting plastics	has		Hybrid solid state switch replaces ( driven power switch	MO COT-	
improved strength, thermal and ch	emical		JPL-931	B67-10165	01
stability LEWIS-10108	B67-10197	03	TRANSPORT VEHICLE		
THIN FILM			Hydrostatic force used to handle ou	tsized,	
Complex surfaces plated by thin-fil			heavy objects HQ-90	B67-10167	05
deposition in one operation LEWIS-292	B67-10006	05	TRICHLOROETHYLENE		
FF#12-595	867-10006	05	Degreasing of titanium to minimize	stress	
Thin film process forms effective e			corrosion LEWIS-382	B67-10147	03
contacts on semiconductor crystal M-FS-2343	B67-10142	01	LEW13-302	BO7-10147	•
BT MTMA			TUBING	- tubina	
TIMING Variable-pulse switching circuit ac	curately		Orbital tube flaring system produce connectors with zero leakage	s tuoing	
controls solenoid-valve actuation	5	0.1	M-FS-2016	B67-10019	05
M-FS-1895	B67-10022	01	TUMOR		
TIMING APPARATUS	A 4		Uranyl phthalocyanines show promise treatment of brain tumors	in the	
Technique for strip chart recorder notation	time		ARG-100	B67-10188	04
GSFC-473	B67-10196	01			
TITANIUM			TUNGSTEN Electron beam welder X-rays its own	welds	
Degreasing of titanium to minimize corrosion	stress		LEWIS-10111	B67-10216	02
LEWIS-382	B67-10147	03	TUNGSTEN INERT GAS /TIG/ WELDING		
TTTANTIM ALLOV			Closed circuit TV system monitors w	elding	
TITANIUM ALLOY Glass bead shot peening retards str			operations MSC-11002	B67-10162	01
corrosion failure of titanium tan LANGLEY-319		05	Continuous internal channels formed	i in	
TWWOFF1-312	201-10130	0.5	Continuous internal channels formed aluminum fusion welds		
TOOL			M-FS-2399	B67-10183	05
Micromanipulation tool is easily ad many uses	ahten to		Weld procedure produces quality wel	ds for	
JPL-129	B67-10004	05	thick sections of Hastelloy-X	B67-10195	05
Tool facilitates installation of Ma	rmon		NUC-10048	201-10133	vo
clamps					

TURBULENT FLOW  Local measurements in turbulent flow through cross correlation of optic			M-FS-2243 Vibrator	B67-10125	01
M-FS-1268	B67-10030	01	Modified univibrator compensates for timing errors	output	
U			ARG-85	B67-10130	01
ULTRASONIC TESTING Correlation established between hea and ultrasonic transmission prope			VIDEO EQUIPMENT  Recording and time expansion technic high-speed, single-shot transient		
copper braze bonds ARG-247	B67-10037	92	signal ARC-10003	B67-10139	01
Calibrating ultrasonic test equipme	nt for		VIDICON		
checking thin metal strip stock NUC-10009 ULTRASONICS	B67-10127	01	Plotter design simplifies determinat image sensor transfer characterist NPO-10164		01
Ultrasonics permits brazing complex	stainless		VISCOSITY		
steel assembly without flux NU-0115	B67-10094	05	Absolute viscosity measured using instrumented parallel plate system JPL-874	B67-10041	01
UPCONVERTER			VISUAL DISPLAY		
Parametric up-converter increases f of maser	lexicility		Absolute viscosity measured using		
KSC-67-98	B67-10104	01	instrumented parallel plate system JPL-874	B67-10041	01
URANIUM ALLOY				20. 200.2	٠-
Fluid-bed fluoride volatility proce recovers uranium from spent urani			VOLATILITY  Fluid-bed fluoride volatility proces	59	
fuels ARG-232	B67-10032	03	recovers uranium from spent urani fuels		
	B07~10032	03	ARG-232	B67-10032	03
URANIUM COMPOUND Uranyl phthalocyanines show promise	in the		VOLTAGE AMPLIFIER		
treatment of brain tumors ARG-100	B67-10188	04	Voltage regulator/amplifier is self- MSC-1240	-regulated B67-10156	01
V			VOLTAGE REGULATOR	_	
VACUUN			Voltage regulator/amplifier is self- MSC-1240	-regulated B67-10156	01
Solar X-ray spectrum reproduced in					
MSC-228	B67-10164	02	Switching-type regulator circuit ha increased efficiency	5	
VACUUM CHAMBER Feed-through connector couples RF p	over into		MSC-1063	B67-10190	01
vacuum chamber NU-0096	B67-10027	01	W		
			WAVEGUIDE		
Vacuum chamber is remotely sealed b eutectic metal NU-0091	y B67-10059	05	Liquid hydrogen densitometer utiliz open-ended microwave cavity LEWIS-390	B67-10115	01
Quartz crystals detect gas contamin			UPL B. GERPMANN		
	ants		WELD STRENGTH		
during vacuum chamber evacuation NPO-10144	ants B67-10205	01	Composite weld rod corrects individ filler weaknesses		
during vacuum chamber evacuation		01	Composite weld rod corrects individ	ual B67-10107	05
during vacuum chamber evacuation NPO-10144 VALVE Variable-pulse switching circuit ac	B67-10205	01	Composite weld rod corrects individ filler weaknesses M-FS-1923 Fixture facilitates helium leak tes	B67-10107	05
during vacuum chamber evacuation NPO-10144 VALVE	B67-10205	01	Composite weld rod corrects individ filler weaknesses M-FS-1923	B67-10107	05 05
during vacuum chamber evacuation NPO-10144  VALVE  Variable-pulse switching circuit accontrols solenoid-valve actuation M-FS-1895  VAPOR PRESSURE  New class of compounds have very lo	B67-10205 curately s B67-10022		Composite weld rod corrects individ filler weaknesses M-FS-1923 Fixture facilitates helium leak tes pipe welds M-FS-2167 WELDED STRUCTURE Tests show that aluminum welds are	B67-10107 ting of B67-10178	
during vacuum chamber evacuation NPO-10144  VALVE  Variable-pulse switching circuit accontrols solenoid-valve actuation M-FS-1895  VAPOR PRESSURE	B67-10205 curately s B67-10022		Composite weld rod corrects individ filler weaknesses M-FS-1923 Fixture facilitates helium leak tes pipe welds M-FS-2167 WELDED STRUCTURE	B67-10107 ting of B67-10178	
during vacuum chamber evacuation NPO-10144  VALVE  Variable-pulse switching circuit accontrols solenoid-valve actuation M-FS-1895  VAPOR PRESSURE  New class of compounds have very iccorressures  ARG-115	B67-10205 curately s B67-10022	01	Composite weld rod corrects individ filler weaknesses M-FS-1923  Fixture facilitates helium leak tes pipe welds M-FS-2167  WELDED STRUCTURE Tests show that aluminum welds are by bead removal M-FS-1817	B67-10107 ting of B67-10178 improved	05
during vacuum chamber evacuation NPO-10144  VALVE  Variable-pulse switching circuit accontrols solenoid-valve actuation M-FS-1895  VAPOR PRESSURE  New class of compounds have very iccompressures ARG-115  VARACTOR DIODE  Efficient millimeter wave /140 GHz/	B67-10205 curately B67-10022 w vapor B67-10184	01	Composite weld rod corrects individ filler weaknesses M-FS-1923  Fixture facilitates helium leak tes pipe welds M-FS-2167  WELDED STRUCTURE Tests show that aluminum welds are by bead removal M-FS-1817  WELDING Controlled ferrite content improves	B67-10107 ting of B67-10178 improved B67-10023	05
during vacuum chamber evacuation NPO-10144  VALVE  Variable-pulse switching circuit accontrols solenoid-valve actuation M-FS-1895  VAPOR PRESSURE  New class of compounds have very lopressures ARG-115  VARACTOR DIODE	B67-10205 curately B67-10022 w vapor B67-10184	01	Composite weld rod corrects individ filler weaknesses M-FS-1923  Fixture facilitates helium leak tes pipe welds M-FS-2167  WELDED STRUCTURE Tests show that aluminum welds are by bead removal M-FS-1817  WELDING	B67-10107 ting of B67-10178 improved B67-10023	05
during vacuum chamber evacuation NPO-10144  VALVE  Variable-pulse switching circuit accontrols solenoid-valve actuation M-FS-1895  VAPOR PRESSURE  New class of compounds have very iccorrectly pressures ARG-115  VARACTOR DIODE  Efficient millimeter wave /140 GHz/for harmonic power generation	B67-10205  curately  B67-10022  w wapor  B67-10184	01	Composite weld rod corrects individ filler weaknesses M-FS-1923  Fixture facilitates helium leak tes pipe welds M-FS-2167  WELDED STRUCTURE Tests show that aluminum welds are by bead removal M-FS-1817  WELDING Controlled ferrite content improves weldability of corrosion-resistan M-FS-568	B67-10107 ting of B67-10178 improved B67-10023 t steel B67-10069	05
during vacuum chamber evacuation NPO-10144  VALVE  Variable-pulse switching circuit ac controls solenoid-valve actuation M-FS-1895  VAPOR PRESSURE  New class of compounds have very ic pressures ARG-115  VARACTOR DIODE  Efficient millimeter wave /140 GHz/for harmonic power generation HQ-61  VENT  High speed blowdown system provides	B67-10205  curately  B67-10022  w wapor  B67-10184  diode  B67-10166	01	Composite weld rod corrects individ filler weaknesses M-FS-1923  Fixture facilitates helium leak tes pipe welds M-FS-2167  WELDED STRUCTURE Tests show that aluminum welds are by bead removal M-FS-1817  WELDING Controlled ferrite content improves weldability of corrosion-resistan M-FS-568  Effects of heat input rates on T-1 T-1A steel welds	B67-10107 ting of B67-10178 improved B67-10023 t steel B67-10069 and	05 05
during vacuum chamber evacuation NPO-10144  VALVE  Variable-pulse switching circuit ac controls solenoid-valve actuation M-FS-1895  VAPOR PRESSURE  New class of compounds have very ic pressures ARG-115  VARACTOR DIODE  Efficient millimeter wave /140 GHz/for harmonic power generation HQ-61  VENT	B67-10205  curately  B67-10022  w wapor  B67-10184  diode  B67-10166	01	Composite weld rod corrects individ filler weaknesses M-FS-1923  Fixture facilitates helium leak tes pipe welds M-FS-2167  WELDED STRUCTURE Tests show that aluminum welds are by bead removal M-FS-1817  WELDING Controlled ferrite content improves weldability of corrosion-resistan M-FS-568  Effects of heat input rates on T-1	B67-10107 ting of B67-10178 improved B67-10023 t steel B67-10069	05
during vacuum chamber evacuation NPO-10144  VALVE  Variable-pulse switching circuit accontrols solenoid-valve actuation M-FS-1895  VAPOR PRESSURE  New class of compounds have very in pressures ARG-115  VARACTOR DIODE  Efficient millimeter wave /140 GHz/for harmonic power generation HQ-61  VENT  High speed blowdown system provides pressure loss  LEWIS-375	B67-10205  curately  B67-10022  www.apor B67-10184  diode B67-10166  rapid B67-10043	01 03 01	Composite weld rod corrects individ filler weaknesses M-FS-1923  Fixture facilitates helium leak tes pipe welds M-FS-2167  WELDED STRUCTURE Tests show that aluminum welds are by bead removal M-FS-1817  WELDING Controlled ferrite content improves weldability of corrosion-resistan M-FS-568  Effects of heat input rates on T-1 T-1A steel welds M-FS-2475  Effect of welding position on poros	B67-10107 ting of B67-10178 improved B67-10023 t steel B67-10069 and B67-10163	05 05
during vacuum chamber evacuation NPO-10144  VALVE  Variable-pulse switching circuit ac controls solenoid-valve actuation M-FS-1895  VAPOR PRESSURE  New class of compounds have very ic pressures ARG-115  VARACTOR DIODE  Efficient millimeter wave /140 GHz/for harmonic power generation HQ-61  VENT  High speed blowdown system provides pressure loss LEWIS-375  Toroidal ring prevents gas ignition vent stack outlet	B67-10205  curately B67-10022  wwwapor B67-10184  diode B67-10166  rapid B67-10043	01 03 01	Composite weld rod corrects individ filler weaknesses M-FS-1923  Fixture facilitates helium leak tes pipe welds M-FS-2167  WELDED STRUCTURE Tests show that aluminum welds are by bead removal M-FS-1817  WELDING Controlled ferrite content improves weldability of corrosion-resistan M-FS-568  Effects of heat input rates on T-1 T-1A steel welds	B67-10107 ting of B67-10178 improved B67-10023 t steel B67-10069 and B67-10163	05 05
during vacuum chamber evacuation NPO-10144  VALVE  Variable-pulse switching circuit ac controls solenoid-valve actuation M-FS-1895  VAPOR PRESSURE  New class of compounds have very long pressures ARG-115  VARACTOR DIODE  Efficient millimeter wave /140 GHz/for harmonic power generation HQ-61  VENT  High speed blowdown system provides pressure loss LEWIS-375  Toroidal ring prevents gas ignition	B67-10205  curately  B67-10022  www.apor B67-10184  diode B67-10166  rapid B67-10043	01 03 01	Composite weld rod corrects individ filler weaknesses M-FS-1923  Fixture facilitates helium leak tes pipe welds M-FS-2167  WELDED STRUCTURE Tests show that aluminum welds are by bead removal M-FS-1817  WELDING Controlled ferrite content improves weldability of corrosion-resistan M-FS-568  Effects of heat input rates on T-1 T-1A steel welds M-FS-2475  Effect of welding position on poros formation in aluminum alloy welds	B67-10107 ting of B67-10178 improved B67-10023 t steel B67-10069 and B67-10163	05 05 03
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MSC-925		7-10083	03
MSC-960		7-10008	02
MSC-1049		7-10003	03
MSC-1063		7-10190	01
MSC-1078	B67	7-10074	01
MSC-1080		7-10084	01
MSC-1093		7-10073	05
MSC-1103		7-10116	01
MSC-1133 MSC-1135		7-10112 7-10109	03 02
MSC-1137		7-10105 7-10095	03
MSC-1144		7-10170	01
MSC-1168		7-10164	02
MSC-1176	B67	7-10111	01
MSC-1178		7-10137	01
MSC-1231		7-10103	01
MSC-1240		7-10156	01
MSC-1263		7-10155 7-10162	01 01
MSC~11002	В67	-10102	VI.
NPO-10019	B67	7-10193	06
NPO-10062		7-10132	03
NPO-10068	B67	7-10204	01
NPO-10123	В В6	7-10207	04
NPO-10124	В67	7-10169	06

NPO-10125	B67-10172	06
NPO-10126	B67-10160	01
NPO-10129	B67-10217	06
NPD-10130	B67-10171	01
NPO-10131	B67-10173	06
NPO-10142	B67-10203	01
NPO-10144	B67-10205	01
NPO-10164	B67-10206	01
NU-0091	B67-10059	05
NU-0095	B67-10062	03
NU-0096	B67-10027	01
NU-0098	B67-10024	02
NU-0108	B67-10046	01
NU-0114	B67-10093	01
NU-0115	B67-10094	05
MO-0110	20. 2000	• •
NUC-10009	B67-10127	01
NUC-10013	B67-10158	05
NUC-10013	B67-10194	03
	B67-10195	05
	B67-10200	05
NUC-10050	D07-10200	•••
	B67-10082	02
W00-286	B01-1005	U.
	B67-10047	05
WS0-329	B67-10047	05
WSO-333	00/-10010	Ų5

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